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POTENTIOMETRIC SELECTIVITY COEFFICIENTS OF ION-SELECTIVE ELECTRODES

PART II. INORGANIC ANIONS

(IUPAC Technical Report)

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Potentiometric selectivity coefficients of ion-selective electrodes

Part II. Inorganic Anions

(IUPAC Technical Report)

Abstract: Potentiometric selectivity coefficients, $K_{A,B}^{pot}$, have been collected for ionophore-based ion-selective electrodes (ISEs) for inorganic anions reported during 1988–1998. In addition to the actual numerical values of $K_{A,B}^{pot}$ together with the methods and conditions for their determination, response slopes, linear concentration (activity) ranges, chemical compositions, and ionophore structures for the ISE membranes are tabulated.

INTRODUCTION

An earlier IUPAC data compilation of potentiometric selectivity coefficients, $K_{A,B}^{pot}$, for ion-selective electrodes (ISEs) was published in 1979 in *Pure and Applied Chemistry* (*PAC*) [1]. It covered $K_{A,B}^{pot}$ data reported during 1966–1977 and was later followed by another extensive compilation of such data in a handbook from CRC Press [2]. The latter covered most of the $K_{A,B}^{pot}$ data reported during the years 1966–1988. An updated compilation reported in 1998 was limited to a number of particularly selective ionophores [3]. Very recently, a data compilation of selectivity coefficients for ionophore-based cation-selective electrodes was published as an IUPAC Technical Report (Part I of this series) in *PAC* [4].

The present paper compiles the latest $K_{A,B}^{pot}$ data for liquid-membrane inorganic-anion ISEs based on neutral and charged ionophores, reported between 1989 and the end of 1998. Moreover, this new compilation also contains some older data that had not been included in the CRC handbook. The presented $K_{A,B}^{pot}$ data are listed together with the methods and conditions for their determinations; also tabulated are response slopes, linear concentration (activity) ranges, chemical compositions, and ionophore structures for the corresponding ISE membranes. The present document constitutes the second part in a series. The third part, published separately in this issue of *PAC*, will cover ISEs for organic ions.

Selectivity coefficients can be measured with different methods that fall into two main groups, namely (1) mixed solution methods, and (2) separate solution methods. The details of the definition of each method have been briefly discussed in the first part of this series [4].

ABBREVIATIONS

A complete list of abbreviations that are used in the following tables is given below.

AcO^-	acetate
BBPA	bis(1-butylpentyl) adipate
BEHS	bis(2-ethylhexyl) sebacate
$Benz^-$	benzoate
c_{dl}	detection limit
CHEMFET	chemically modified ion-sensitive field effect transistor
CWE	coated wire electrode
DBE	dibenzyl ether
DBS	dibutyl sebacate

DBP	dibutyl phthalate
DDP	didecyl phthalate
DDS	didecyl sebacate (occasionally reported as dodecyl sebacate, which appears to be erroneous)
DMSNE	(*R*,*R*)-2,3-dimethoxysuccinic acid bis(1-butylpentyl) ester
DOA	bis(2-ethylhexyl) adipate
DOP	bis(2-ethylhexyl) phthalate {'dioctyl phthalate'}
DOS	bis(*n*-octyl) sebacate
emf	electromotive force
$EDOA \cdot NO_3$	ethyldidecyloctadecylammonium nitrate
ETH 469	decane-1,10-diyl diglutarate bi(1-butylpentyl) ester
ETH 500	tetradodecylammonium tetrakis(4-chlorophenyl)borate
FIA	flow injection analysis
FIM	fixed interference method
FNDPE	2-fluorophenyl 2-nitrophenyl ether
FPM	fixed primary ion method
ISE	ion-selective electrode
ISFET	ion-sensitive field effect transistor
KTFPB	potassium tetrakis[3,5-bis(trifluoromethyl)phenyl]borate
KTPB	potassium tetraphenylborate
KTpClPB	potassium tetrakis(4-chlorophenyl)borate
M	mol dm^{-3}
MPM	matched potential method
MSM	mixed solution method
N	Nernstian
NaTFPB	sodium tetrakis[3,5-bis(trifluoromethyl)phenyl]borate
NaTPB	sodium tetraphenylborate
NaTpClPB	sodium tetrakis(4-chlorophenyl)borate
nN	near-Nernstian
oNPOE	2-nitrophenyl octyl ether
oNPPE	2-nitrophenyl phenyl ether
PVC	poly(vinyl chloride)
r.o.o.g.	read out of graph (where data in original paper were in graphical rather than numerical form)
Sal^-	salicylate
SSM	separate solution method (to be used for $a_A = a_B$ method)
SSM ($E_A = E_B$)	separate solution method (to be used for $E_A = E_B$ method)
τ	life time
t_{resp}	response time
t_{90}, t_{95}	time that elapses between the instant at which an ISE and a reference electrode are brought into contact with a new sample solution and the instant at which the potential has changed to a value corresponding to 90 % or 95 %, respectively, of the activity change
TDDMACl	tridodecylmethylammonium chloride
TOABr	tetraoctylammonium bromide
TODABr	trioctyldodecylammonium bromide
TOMACl	trioctylmethylammonium chloride
TPP	triphenyl phosphate
TSM	two solution method

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Table 1 CO_3^{2-}-selective electrodes.

ionophore	membrane composition	$\lg K_{CO_3^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
CO_3^{2-}-1	**CO_3^{2-}-1** tetraoctylammonium chloride (0.01 M)	HCO_3^-, –2.96; NO_3^-, –1.21; HPO_4^{2-}, –3.15; SO_4^{2-}, –3.32; Cl^-, –3.17; AcO^-, –1.60	SSM (bi-ionic potential)	–	0.1 0.025 (HPO_4^{2-})	–30	10^{-2} – 10^{-6}	$6 < pH < 9.5$; $\tau > 30$ d; t_{resp} = 0.5-2 min	[1]
	CO_3^{2-}-1 (w = 9.5 %), TDDMACl (x_i = 4.3 %), BEHS (w = 52 %), cellulose triacetate (w = 37.5 %)	NO_3^-, –0.33; Cl^-, –2.54; ClO_4^-, +1.93; I^-, +0.43; pyruvate, –0.48; oxalacetate, –0.49;	SSM ($E_A = E_B$)	–	0.01 0.1 (Cl^-)	–	–	pH = 8.6	[2]
		Sal^-, +0.57			1×10^{-5}				
		Sal^-, +0.97			3×10^{-5}				
		Sal^-, +1.56			1×10^{-4}				
		Sal^-, +2.04			3×10^{-4}				
		Sal^-, +2.71			1×10^{-3}				
		Sal^-, +3.18			3×10^{-3}				
		Sal^-, +3.73			1×10^{-2}				
	CO_3^{2-}-1 (w = 9.5 %), TDDMACl (x_i = 4.3 %), BEHS (w = 52 %), asymmetric cellulose triacetate (w = 37.5 %)	NO_3^-, –0.36; Cl^-, –2.52; ClO_4^-, +1.76; I^-, +0.43; pyruvate, –1.54; oxalacetate, –1.54;	SSM ($E_A = E_B$)	–	0.01 0.1 (Cl^-)	–	–	pH = 8.6	[2]
		Sal^-, +0.18			1×10^{-5}				
		Sal^-, +0.30			3×10^{-5}				
		Sal^-, +0.58			1×10^{-4}				
		Sal^-, +1.72			3×10^{-4}				
		Sal^-, +2.43			1×10^{-3}				
		Sal^-, +3.00			3×10^{-3}				
		Sal^-, +3.58			1×10^{-2}				
	CO_3^{2-}-1 (w = 5.8 %), TDDMACl (x_i = 40 %), BEHS (w = 50.2 %), PVC (w = 38.2 %)	Cl^-, –2.0; HPO_4^{2-}, –3.9; $H_2PO_4^-$, –3.6; SO_4^{2-} AcO^-, –2.8; Sal^-, +7.8	SSM	0.1	0.1	–31.3	–	25 ± 1 °C; $7.0 < pH < 7.8$; $c_{dl} = 10^{-4.7}$ M; r.o.o.g.	[3,4]
CO_3^{2-}-2	**CO_3^{2-}-2** (0.50 M) tetradecylammonium carbonate (0.01 M), oNPOE, PVC (weight ratio not reported)	$B_4O_7^{2-}$, –0.1; NO_3^-, –1.9; $H_2PO_4^-$, –12.0; SO_4^{2-}, –6.0; Cl^-, –3.8; AcO^-, –7.4; $Benz^-$, +1.4	SSM	–	–	–	–	r.o.o.g.	[5]
	CO_3^{2-}-2 (0.35 M) tetradecylammonium carbonate (0.01 M), oNPOE, PVC (weight ratio not reported)	$B_4O_7^{2-}$, –0.3; NO_3^-, –1.0; HPO_4^{2-}, –1.5; $H_2PO_4^-$, –11.9; Cl^-, –3.8; AcO^-, –7.5; $Benz^-$, +1.6	SSM	–	–	–	–	r.o.o.g.	[5]

(*continues on next page*)

Table 1 (*Continued*).

ionophore	membrane composition	$\lg K_{CO_3^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
	CO_3^{2-}-2 (0.15 M) tetradecylammonium carbonate (0.01 M), oNPOE, PVC (weight ratio not reported)	$B_4O_7^{2-}$, –1.0; NO_3^-, +0.4; HPO_4^{2-}, –2.0; $H_2PO_4^-$, –11.9; SO_4^{2-}, –6.0; Cl^-, –3.9; AcO^-, –7.1; $Benz^-$,+ 2.2	SSM	–	–	–29	$10^{-2.8}$ – $10^{-7.3}$	r.o.o.g.	[5]
	CO_3^{2-}-2 (0.06 M) tetradecylammonium carbonate (0.01 M), oNPOE, PVC (weight ratio not reported)	$B_4O_7^{2-}$, –1.9; NO_3^-, +3.1; HPO_4^{2-}, –2.5; $H_2PO_4^-$, –11.9; SO_4^{2-}, –5.5; Cl^-, –3.5; AcO^-, –6.1	SSM	–	–	–29	$10^{-2.8}$ – $10^{-7.3}$	r.o.o.g.	[5]
	CO_3^{2-}-2 (0.03 M) tetradecylammonium carbonate (0.01 M), oNPOE, PVC (weight ratio not reported)	$B_4O_7^{2-}$, –2.8; NO_3^-, +6.0; HPO_4^{2-}, –3.0; $H_2PO_4^-$, –12.0; SO_4^{2-}, –5.3	SSM	–	–	–29	$10^{-2.8}$ – $10^{-7.3}$	r.o.o.g.	[5]
	CO_3^{2-}-2 (0.025 M) tetradecylammonium carbonate (0.01 M), oNPOE, PVC (weight ratio not reported)	NO_3^-, +9.0; Cl^-, +0.0; HPO_4^{2-}, –3.0; $H_2PO_4^-$, –10.0; AcO^-, –0.2	SSM	–	–	–29	$10^{-2.8}$ – $10^{-7.3}$	r.o.o.g.	[5]
	CO_3^{2-}-2 (0.02 M) tetradecylammonium carbonate (0.01 M), oNPOE, PVC (weight ratio not reported)	$B_4O_7^{2-}$, –2.9; NO_3^-, +14.0; HPO_4^{2-}, –3.5; $H_2PO_4^-$, –5.5; Cl^-, +3.9; AcO^-, –0.1; $Benz^-$, +5.0	SSM	–	–	–	–	r.o.o.g.	[5]
	CO_3^{2-}-2 (0.015 M) tetradecylammonium carbonate (0.01 M), oNPOE, PVC (weight ratio not reported)	$Benz^-$, +6.3	SSM	–	–	–	–	r.o.o.g.	[5]
	CO_3^{2-}-2 (0.0025 M) tetradecylammonium carbonate (0.01 M), oNPOE, PVC (weight ratio not reported)	Cl^-, +5.0	SSM	–	–	–	–	r.o.o.g.	[5]
	CO_3^{2-}-2 (0.0006 M) tetradecylammonium carbonate (0.01 M), oNPOE, (weight ratio not reported)	NO_3^-, +15.0	SSM	–	–	–	–	r.o.o.g.	[5]
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), PVC : DOP = 1:3 (wt/wt)	SCN^-, +0.9; NO_2^-, –2.4; NO_3^-, –1.5; HPO_4^{2-}, –1.2; $H_2PO_4^-$, –6.3; Br^-, –4.1; AcO^-, –2.8; Sal^-, +5.0	SSM	–	–	–26.5 ± 1.3* –27.0 ± 0.6**	– –	photocured membranes; *5 days; **45 days	[6]

Table 1 (*Continued*).

ionophore	membrane composition	$\lg K_{CO_3^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), PVC : DOP = 1:2 (wt/wt)	SCN^-, +1.0; NO_2^-, –2.4; NO_3^-, –1.4; $H_2PO_4^-$, –6.6; HPO_4^{2-}, –1.1; Br^-, –4.1; AcO^-, –2.9; Sal^-, +5.2	SSM	–	–	–25.9 ± 1.4*– –26.6 ± 0.8**–		photocured membranes; *5 days; **45 days	[6]
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), PVC : DOP = 1:1 (wt/wt)	SCN^-, +1.3; NO_2^-, –2.5; NO_3^-, –1.4; HPO_4^{2-}, –1.3; $H_2PO_4^-$, –8.1; Br^-, –4.3; AcO^-, –3.3; Sal^-, +6.0	SSM	–	–	–23.1 ± 1.3*– –25.2 ± 0.9**–		photocured membranes; *5 days; **45 days	[6]
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), polymer[a] : DOP = 1:1 (wt/wt)	SCN^-, +2.8; NO_2^-, –2.1; NO_3^-, –0.7; HPO_4^{2-}, –1.1; $H_2PO_4^-$, –7.3; SO_4^{2-}, –5.4; Cl^-, –3.8; Br^-, –3.1; AcO^-, –3.2; Sal^-, +5.8	SSM	–	–	–26.8 ± 1.3*– –26.2 ± 0.6**–		photocured membranes; *5 days; **45 days	[6]
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), polymer[a] : DOP = 2:1 (wt/wt)	SCN^-, +3.2; NO_2^-, –2.6; NO_3^-, –0.9; HPO_4^{2-}, –1.4; $H_2PO_4^-$, –8.6; SO_4^{2-}, –7.5; Cl^-, –4.6; Br^-, –3.2; AcO^-, –3.6; Sal^-, +5.6	SSM	–	–	–24.3 ± 1.2*– –24.2 ± 0.5**–		photocured membranes; *5 days; **45 days	[6]
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), polymer[a] : DOP = 3:1 (wt/wt)	SCN^-, +2.9; NO_2^-, –4.0; NO_3^-, –2.5; HPO_4^{2-}, –1.0; $H_2PO_4^-$, –10.1; Br^-, –3.9; AcO^-, –3.8; Sal^-, +4.4	SSM	–	–	–21.7 ± 1.5*–		photocured membranes; *5 days	[6]
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), KTpClPB (x_i = 10 %), polymer[a] : DOP = 1:1 (wt/wt)	SCN^-, +2.2; NO_3^-, –0.1; $H_2PO_4^-$, –6.6; SO_4^{2-}, –5.7; Cl^-, –4.0; Br^-, –2.7; AcO^-, –3.3; Sal^-, +5.0	SSM	–	–	–24.7 ± 0.5*– –26.1 ± 0.7**–		photocured membranes; *5 days; **45 days	[6]
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), KTpClPB (x_i = 18 %), polymer[a] : DOP = 1:1 (wt/wt)	SCN^-, +0.3; NO_3^-, –2.0; $H_2PO_4^-$, –7.8; SO_4^{2-}, –7.5; Cl^-, –4.1; Br^-, –4.2; AcO^-, –3.5; Sal^-, +2.7	SSM	–	–	–26.6 ± 0.8*– –22.5 ± 2.4**–		photocured membranes; *5 days; **45 days	[6]
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), KTpClPB(x_i = 20 %), polymer[a] : DOP = 1:1 (wt/wt)	SCN^-, +0.5; NO_3^-, –2.1; $H_2PO_4^-$, –6.3; SO_4^{2-}, –7.9; Cl^-, –5.1; Br^-, –4.2; AcO^-, –3.7; Sal^-, +2.9	SSM	–	–	–24.6 ± 0.7*– –24.0 ± 1.3**–		photocured membranes; *5 days; **45 days	[6]

[a] A mixture of urethane diacrylate (78 wt %), hexanediol diacrylate (20 wt %) and 2-hydroxy-2-methyl-1-phenylpropane-1-one (2 wt %).

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Table 1 (*Continued*).

ionophore	membrane composition	$\lg K_{CO_3^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), KTpClPB (x_i = 10 %), polymer[a] : DOP = 2:1 (wt/wt)	SCN^-, +0.4; NO_3^-, –2.5; $H_2PO_4^-$, –7.6; SO_4^{2-}, –7.2; Cl^-, –4.6; Br^-, –3.8; AcO^-, –3.6; Sal^-, +2.5	SSM	–	–	–27.3 ± 0.9* –26.0 ± 0.7**	– –	photocured membranes; *5 days; **45 days	[6]
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), KTpClPB (x_i = 18 %), polymer[a] : DOP = 2:1 (wt/wt)	SCN^-, +0.4; NO_3^-, –2.5; $H_2PO_4^-$, –7.8; SO_4^{2-}, –6.8; Cl^-, –6.1; Br^-, –4.2; AcO^-, –3.8; Sal^-, +2.6	SSM	–	–	–25.9 ± 1.0*	–	photocured membranes; *5 days	[6]
	CO_3^{2-}-2 (0.2 M), tetradecylammonium carbonate (x_i = 5 %), KTpClPB (x_i = 20 %), polymer[a] : DOP = 2:1 (wt/wt)	SCN^-, +0.4; NO_3^-, –3.0; $H_2PO_4^-$, –8.2; SO_4^{2-}, –7.8; Cl^-, –5.0; Br^-, –4.7; AcO^-, –3.5; Sal^-, +2.2	SSM	–	–	–26.3 ± 0.7* –26.9 ± 1.3**	– –	photocured membranes; *5 days; **45 days	[6]
CO_3^{2-}-3	**CO_3^{2-}-3** (w = 2.6 %), TDDMACl (x_i = 41 %), BEHS (w = 54.4 %), PVC (w = 40.8 %)	SCN^-, +9.0; NO_3^-, +5.0; HPO_4^{2-}, –1.3; SO_4^{2-}, –1.2; Cl^-, +1.3; Br^-, +4.1; Sal^-, +8.5	SSM	0.014 (as $NaHCO_3$)	0.1	–	–	21 ± 1 °C; r.o.o.g.	[7]
CO_3^{2-}-4	**CO_3^{2-}-4** (w = 2.6 %), TDDMACl (x_i = 41 %), BEHS (w = 54.4 %), PVC (w = 40.8 %)	SCN^-, +5.5; NO_3^-, +2.3; HPO_4^{2-}, –4.5; SO_4^{2-}, –4.3; Cl^-, –1.8; Br^-, +2.3; Sal^-, +5.8	SSM	0.014 (as $NaHCO_3$)	0.1	–	–	21 ± 1 °C; r.o.o.g.	[7]
CO_3^{2-}-5	**CO_3^{2-}-5** (w = 3.0 %), TDDMACl (x_i = 41 %), BEHS (w = 54.3 %), PVC (w = 40.8 %)	SCN^-, +4.1; NO_3^-, +1.0; HPO_4^{2-}, –5.0; SO_4^{2-}, –4.8; Cl^-, –3.2; Br^-, –1.2; Sal^-, +5.0	SSM	0.014 (as $NaHCO_3$)	0.1	–	–	21 ± 1 °C; r.o.o.g.	[7]
CO_3^{2-}-6	**CO_3^{2-}-6** (w = 3.2 %), TDDMACl (x_i = 41 %), BEHS (w = 54.2 %), PVC (w = 40.6 %)	SCN^-, +3.2; NO_3^-, +0.2; HPO_4^{2-}, –5.0; SO_4^{2-}, –4.8; Cl^-, –3.8; Br^-, –1.3; Sal^-, +5.0	SSM	0.014 (as $NaHCO_3$)	0.1	–	–	21 ±1 °C; r.o.o.g.	[7]
CO_3^{2-}-7	**CO_3^{2-}-7** (w = 3.4 %), TDDMACl (x_i = 41 %), BEHS (w = 54.0 %), PVC (w = 40.5 %)	SCN^-, +3.0; NO_3^-, +0.2; HPO_4^{2-}, –4.4; SO_4^{2-}, –4.4; Cl^-, –4.0; Br^-, –1.6; Sal^-, +5.4	SSM	0.014 (as $NaHCO_3$)	0.1	–	–	21 ± 1 °C; r.o.o.g.	[7]
CO_3^{2-}-8	**CO_3^{2-}-8** (w = 3.8 %), TDDMACl (x_i = 40 %), BEHS (w = 53.6 %), PVC (w = 40.7 %)	Cl^-, –4.0	SSM	0.1 (as $NaHCO_3$)	0.1	–32.5	–	25 ± 1 °C; $7.0 < pH < 7.8$; $c_{dl} = 10^{-6.5}$ M	[4]

Table 1 (*Continued*).

ionophore	membrane composition	$\lg K_{CO_3^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	CO_3^{2-}-8 (w = 3.7 %), TDDMACl (x_i = 41 %), BEHS (w = 53.8 %), PVC (w = 40.4 %)	SCN^-, +1.5; NO_3^-, –1.2; HPO_4^{2-}, –5.7; SO_4^{2-}, –5.0; Cl^-, –5.0; Br^-, –3.2; Sal^-, +4.1	SSM	0.014 (as $NaHCO_3$)	0.1	–	–	21 ± 1 °C; r.o.o.g.; τ = about 30 d	[7]
CO_3^{2-}-9	**CO_3^{2-}-9** (w = 2.7 %), TDDMACl (x_i = 40 %), BEHS (w = 54.1 %), PVC (w = 41.1 %)	Cl^-, –4.0	SSM	0.1 (as $NaHCO_3$)	0.1	–30.9	–	25 ± 1 °C; 7.0 < pH < 7.8; $c_{dl} = 10^{-6.0}$ M	[4]
CO_3^{2-}-10	**CO_3^{2-}-10** (w = 2.7 %), TDDMACl (x_i = 41 %), BEHS (w = 54.4 %), PVC (w = 40.8 %)	SCN^-, +1.4; NO_3^-, –1.2; HPO_4^{2-}, –5.0; SO_4^{2-}, –5.0; Cl^-, –5.0; Br^-, –3.2; Sal^-, +4.6	SSM	0.014 (as $NaHCO_3$)	0.1	–	–	21 ± 1 °C; r.o.o.g.	[7]
CO_3^{2-}-11	**CO_3^{2-}-11** (w = 3.5 %), TDDMACl (x_i = 40 %), BEHS (w = 53.7 %), PVC (w = 40.8 %)	Cl^-, –4.0	SSM	0.1 (as $NaHCO_3$)	0.1	–30.2	–	25 ± 1 °C; 7.0 < pH < 7.8; $c_{dl} = 10^{-6.0}$ M	[4]
	CO_3^{2-}-11 (w = 3.5 %), TDDMACl (x_i = 41.0 %), BEHS (w = 54.0 %), PVC (w = 40.5 %)	SCN^-, +1.4; NO_3^-, –1.2; HPO_4^{2-}, –5.0; SO_4^{2-}, –5.0; Cl^-, –5.0; Br^-, –3.2; Sal^-, +4.4	SSM	0.014 (as $NaHCO_3$)	0.1	–	–		[7]
CO_3^{2-}-12	**CO_3^{2-}-12** (w = 3.4 %), TDDMACl (x_i = 40 %), BEHS (w = 53.7 %), PVC (w = 40.8 %)	Cl^-, –2.1; HPO_4^{2-}, –2.4; $H_2PO_4^-$, –3.9; AcO^-, –3.0; Sal^-, +5.2	SSM	0.1 (as $NaHCO_3$)	0.1	–29	–	25 ± 1 °C; r.o.o.g.	[3]
	CO_3^{2-}-12 (w = 5.8 %), TDDMACl (x_i = 40 %), BEHS (w = 50.2 %), PVC (w = 38.2 %)	Cl^-, –2.2	SSM	0.1 (as $NaHCO_3$)	0.1	–29.6	–	25 ± 1 °C; 7.0 < pH < 7.8; $c_{dl} = 10^{-5.3}$ M	[4]
CO_3^{2-}-13	**CO_3^{2-}-13** (w = 3.1 %), TDDMACl (x_i = 40 %), BEHS (w = 53.9 %), PVC (w = 41.0 %)	Cl^-, –3.0; HPO_4^{2-}, +0.6; $H_2PO_4^-$, –6.0; AcO^-, –2.1; Sal^-, +3.6	SSM	0.1 (as $NaHCO_3$)	0.1	–	–	25 ± 1 °C; r.o.o.g.	[3]
		Cl^-, –2.5	SSM	0.1 (as $NaHCO_3$)	0.1	–29/–10*	–	25 ± 1 °C; *pH dependent; $c_{dl} = 10^{-4.7/-3.5}$ M	[4]

(*continues on next page*)

Table 1 (*Continued*).

ionophore	membrane composition	$\lg K_{CO_3^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
CO_3^{2-}-14	**CO_3^{2-}-14** (w = 4.2 %), TDDMACl (x_i = 13 %), DOA (w = 55.5 %) PVC (w = 39.6 %)	SCN^-, +1.7; NO_3^-, –1.7; Cl^-, –3.7; ClO_4^-, +2.6; AcO^-, –3.5; Sal^-, +2.5	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–28	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-14 (w = 4.2 %), TDDMACl (x_i = 27 %), DOA (w = 55.1 %), PVC (w = 39.3 %)	SCN^-, +0.5; NO_3^-, –1.4; Cl^-, –5.0; ClO_4^-, +1.3; AcO^-, –3.7; Sal^-, +1.3	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-14 (w = 4.1 %), TDDMACl (x_i = 53 %), DOA (w = 54.3 %), PVC (w = 38.8 %)	SCN^-, +0.5; NO_3^-, –1.4; Cl^-, –5.0; ClO_4^-, +1.4; AcO^-, –3.5; Sal^-, +2.5	SSM ($E_A = E_B$)	1.5 x 10^{-4}	–	–	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-14 (w = 4.1 %), TDDMACl (x_i = 80 %), DOA (w = 54.0 %), PVC (w = 38.2 %)	SCN^-, +1.0; NO_3^-, –1.0; Cl^-, –3.8; ClO_4^-, +1.4; AcO^-, –3.5; Sal^-, +1.5	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-14 (w = 4.0 %), TDDMACl (x_i = 100 %), DOA (w = 53.6 %), PVC (w = 37.8 %)	SCN^-, +1.3; NO_3^-, –0.6; Cl^-, –3.3; ClO_4^-, +1.6; AcO^-, –3.0; Sal^-, +1.4	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-14 (w = 4.0 %), TDDMACl (x_i = 134 %), DOA (w = 52.3 %), PVC (w = 37.3 %)	SCN^-, +1.3; NO_3^-, +0.1; Cl^-, –2.5; ClO_4^-, +1.6; AcO^-, –2.7; Sal^-, +1.4	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-14 (w = 3.9 %), TDDMACl (x_i = 169 %), DOA (w = 51.4 %), PVC (w = 36.7 %)	SCN^-, +1.5; NO_3^-, +0.6; Cl^-, –1.6; ClO_4^-, +1.8; AcO^-, –1.9; Sal^-, +1.7	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-14 (w = 3.8 %), TDDMACl (x_i = 200 %), DOA (w = 50.5 %), PVC (w = 35.9 %)	SCN^-, +1.8; NO_3^-, –1.3; Cl^-, –1.5; ClO_4^-, +1.8; AcO^-, –1.8; Sal^-, +1.8	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–	–	pH = 8.6; r.o.o.g.	[8]
CO_3^{2-}-15	**CO_3^{2-}-15** (w = 1.2 %), TDDMACl (x_i = 13 %), DOA (w = 57.6 %), PVC (w = 41.1 %)	SCN^-, +1.0; NO_3^-, –2.3; Cl^-, –2.7; ClO_4^-, +1.8; AcO^-, –2.7; Sal^-, +1.1	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–14	–	pH = 8.6; r.o.o.g.	[8]

Table 1 (*Continued*).

ionophore	membrane composition	$\lg K_{CO_3^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	CO_3^{2-}-15 (w = 1.2 %), TDDMACl (x_i = 27 %), DOA (w = 57.5 %), PVC (w = 41.0 %)	SCN^-, –0.5; NO_3^-, –2.5; Cl^-, –4.0; ClO_4^-, +0.5; AcO^-, –3.4; Sal^-, +0.8	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–28	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-15 (w = 1.2 %), TDDMACl (x_i = 53 %), DOA (w = 57.3 %), PVC (w = 40.9 %)	SCN^-, +0.5; NO_3^-, –2.6; Cl^-, –4.5; ClO_4^-, +0.5; AcO^-, –3.4; Sal^-, +0.7	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–28.5	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-15 (w = 1.2 %), TDDMACl (x_i = 80 %), DOA (w = 57.1 %), PVC (w = 40.8 %)	SCN^-, +0.1; NO_3^-, –2.4; Cl^-, –5.0; ClO_4^-, +0.9; AcO^-, –4.6; Sal^-, +0.9	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–25	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-15 (w = 1.2 %), TDDMACl (x_i = 100 %), DOA (w = 57.0 %), PVC (w = 40.7 %)	SCN^-, +0.8; NO_3^-, –1.6; Cl^-, –4.4; ClO_4^-, +1.7; AcO^-, –3.9; Sal^-, +1.3	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–19	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-15 (w = 1.2 %), TDDMACl (x_i = 134 %), DOA (w = 56.8 %), PVC (w = 40.5 %)	SCN^-, +2.7; NO_3^-, +0.8; Cl^-, –1.6; ClO_4^-, +3.3; AcO^-, –1.8; Sal^-, +2.5	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–6	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-15 (w = 1.2 %), TDDMACl (x_i = 169 %), DOA (w = 56.6 %), PVC (w = 40.4 %)	SCN^-, +1.5; NO_3^-, +0.6; Cl^-, –1.6; ClO_4^-, +1.8; AcO^-, –1.9; Sal^-, +1.7	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–4	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-15 (w = 1.2 %), TDDMACl (x_i = 200 %), DOA (w = 56.4 %), PVC (w = 40.2 %)	SCN^-, +3.1; NO_3^-, +1.5; Cl^-, –0.9; ClO_4^-, +3.5; AcO^-, –1.7; Sal^-, +2.5	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–4	–	pH = 8.6; r.o.o.g.	[8]
CO_3^{2-}-16	**CO_3^{2-}-16** (w = 1.2 %), TDDMACl (x_i = 13 %), DOA (w = 57.5 %), PVC (w = 41.0 %)	SCN^-, +1.9; NO_3^-, –1.5; Cl^-, –3.8; ClO_4^-, +2.8; AcO^-, –2.7; Sal^-, +2.7	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–14	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-16 (w = 1.2 %), TDDMACl (x_i = 27 %), DOA (w = 57.4 %), PVC (w = 41.0 %)	SCN^-, +0.7; NO_3^-, –1.3; Cl^-, –3.6; ClO_4^-, +1.7; AcO^-, –3.7; Sal^-, +1.8	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–23	–	pH = 8.6; r.o.o.g.	[8]

(*continues on next page*)

Table 1 (*Continued*).

ionophore	membrane composition	$\lg K_{CO_3^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	CO_3^{2-}-16 (w = 1.2 %), TDDMACl (x_i = 53 %), DOA (w = 57.2 %), PVC (w = 40.8 %)	SCN^-, +0.6; NO_3^-, –1.4; Cl^-, –3.7; ClO_4^-, +1.6; AcO^-, –4.4; Sal^-, +1.7	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–28	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-16 (w = 1.2 %), TDDMACl (x_i = 80 %), DOA (w = 57.0 %), PVC (w = 40.7 %)	SCN^-, +1.4; NO_3^-, –0.6; Cl^-, –3.6; ClO_4^-, +1.9; AcO^-, –3.4; Sal^-, +2.2	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–31	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-16 (w = 1.2 %), TDDMACl (x_i = 100 %), DOA (w = 56.9 %), PVC (w = 40.6 %)	SCN^-, +2.1; NO_3^-, +1.6; Cl^-, –2.6; ClO_4^-, +2.3; AcO^-, –2.0; Sal^-, +2.7	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–31	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-16 (w = 1.2 %), TDDMACl (x_i = 134 %), DOA (w = 56.6 %), PVC (w = 40.4 %)	SCN^-, +2.9; NO_3^-, +1.5; Cl^-, –1.7; ClO_4^-, +2.7; AcO^-, –1.0; Sal^-, +3.2	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–13	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-16 (w = 1.2 %), TDDMACl (x_i = 169 %), DOA (w = 56.3 %), PVC (w = 40.2 %)	SCN^-, +2.9; NO_3^-, +1.5; Cl^-, –1.8; ClO_4^-, +3.1; AcO^-, –1.0; Sal^-, +2.6	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–3	–	pH = 8.6; r.o.o.g.	[8]
	CO_3^{2-}-16 (w = 1.2 %), TDDMACl (x_i = 200 %), DOA (w = 56.1 %), PVC (w = 40.0 %)	SCN^-, +2.8; NO_3^-, +1.5; Cl^-, –2.6; ClO_4^-, +3.0; AcO^-, –1.0; Sal^-, +2.7	SSM ($E_A = E_B$)	1.5×10^{-4}	–	–3	–	pH = 8.6; r.o.o.g.	[8]

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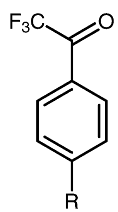
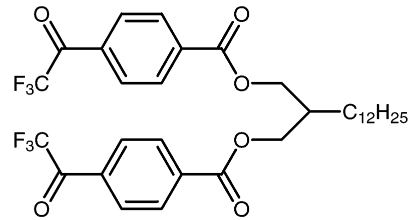
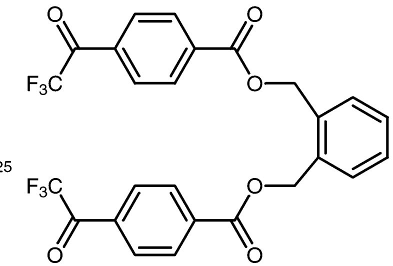
Table 1 (*Continued*).



CO_3^{2-}-1 (M_r = 230.23): R = C_4H_9
CO_3^{2-}-2 (M_r = 258.28): R = C_6H_{13}
CO_3^{2-}-3 (M_r = 301.35): R = $NCH_3C_7H_{15}$
CO_3^{2-}-4 (M_r = 302.34): R = OC_8H_{17}
CO_3^{2-}-5 (M_r = 342.44): R = $C_{12}H_{25}$
CO_3^{2-}-6 (M_r = 374.50): R = $SC_{12}H_{25}$
CO_3^{2-}-7 (M_r = 399.50): R = $NCH_3C_{12}H_{25}$
CO_3^{2-}-8 (M_r = 441.58): R = $CON(C_8H_{17})_2$
CO_3^{2-}-9 (M_r = 330.35): R = $COOC_8H_{17}$
CO_3^{2-}-10 (M_r = 316.32): R = $COOC_7H_{15}$
CO_3^{2-}-11 (M_r = 406.50): R = $SO_2C_{12}H_{25}$
CO_3^{2-}-12 (M_r = 398.55): R = $C_{16}H_{33}$
CO_3^{2-}-13 (M_r = 358.44): R = $OC_{12}H_{25}$
CO_3^{2-}-14 (M_r = 314.39): R = $C_{10}H_{21}$



CO_3^{2-}-15 (ETH 6025, M_r = 644.65)



CO_3^{2-}-16 (M_r = 538.40)

Table 2 SCN^--selective electrodes.

ionophore	membrane composition	$\lg K_{SCN^-,X^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
SCN⁻-1	**SCN⁻-1** (saturated), chloroform	NO_3^-, –2.4; OH^-, –0.8; Cl^-, –2.5; ClO_4^-, –1; Br^-, –2.0; I^-, –0.4	FIM	–	0.01 0.005 (ClO_4^-, Br^-) 0.001 (I^-)	–59	$10^{-4.5}$–10^{-2}	–	[1]
	SCN⁻-1 (saturated), nitrobenzene	ClO_4^-, –0.92; I^-, –0.15	FIM	–	0.005 (ClO_4^-, Br^-) 0.001 (I^-)	–56	10^{-5}–10^{-2}	0.0025 M excess of ionophore	[1]
	SCN⁻-1 (5 mM), chloroform	ClO_4^-, –1.5; I^-, +0.079	FIM	–	0.005 (ClO_4^-) 0.001 (I^-)	–59	10^{-4}–10^{-2}	0.1 M excess of ionophore	[1]
	SCN⁻-1 (5 mM), nitrobenzene	NO_3^-, <–2.9; OH^-, –2.2 Cl^-, <–2.8; ClO_4^-, –0.3; Br^-, –2.3; I^-, –1	FIM	–	0.01 0.005 (ClO_4^-, Br^-) 0.001 (I^-)	–57	10^{-5}–10^{-2}	–	[1]
SCN⁻-2	**SCN⁻-2** (saturated), chloroform	NO_3^-, –2.9; OH^-, +1.9; Cl^-, –2.5; ClO_4^-, –0.92; Br^-, –1.3; I^-, +1.9	FIM	–	0.01; 0.005 (ClO_4^-, Br^-); 0.001 (I^-)	–52	10^{-5}–10^{-2}	–	[1]
	SCN⁻-2 (saturated), nitrobenzene	NO_3^-, –2.8; OH^-, –0.3; Cl^-, –2.8; ClO_4^-, +0.3; Br^-, –2.; I^-, –0.3	FIM	–	0.01 0.005 (ClO_4^-, Br^-) 0.001 (I^-)	–55	10^{-5}–10^{-2}	–	[1]
SCN⁻-3	**SCN⁻-3** (saturated), chloroform	NO_3^-, –2.3; Cl^-, –1.9; Br^-, –1.4; ClO_4^-, –1; OH^-, +2; I^-, –0.1	FIM	–	0.01 0.005 (ClO_4^-, Br^-) 0.001 (I^-)	–49	10^{-4}–10^{-2}	–	[1]
	SCN⁻-3 (saturated), nitrobenzene	NO_3^-, <–2.2; OH^-, –1.2; Cl^-, –1.9; ClO_4^-, 0; Br^-, –1.5; I^-, –0.5	FIM	–	0.01 ; 0.005 (ClO_4^-, Br^-) 0.001 (I^-)	–53	10^{-4}–10^{-2}	–	[1]
SCN⁻-4	**SCN⁻-4** (saturated), chloroform	NO_3^-, <–3; OH^-, 1.9; Cl^-, –1.6; ClO_4^-, –1.2; Br^-, –1.7; I^-, –0.34	FIM	–	0.01 0.005 (ClO_4^-, Br^-) 0.001 (I^-)	–53	$10^{-4.5}$–10^{-2}	–	[1]
	SCN⁻-4 (saturated), nitrobenzene	NO_3^-, <–2.7; OH^-, <–3; Cl^-, <–2.9; ClO_4^-, –0.3; Br^-, –1.7; I^-, –0.7	FIM	–	0.01 0.005 (ClO_4^-, Br^-) 0.001 (I^-)	–55	$10^{-4.5}$–10^{-2}	–	[1]
SCN⁻-5	**SCN⁻-5** (saturated), nitrobenzene	NO_3^-, –2.0; OH^-, –0.7; Cl^-, –2; ClO_4^-, –0.046; Br^-, –1.7; I^-, –0.15	FIM	–	0.01 0.005 (ClO_4^-, Br^-) 0.001 (I^-)	–58	10^{-4}–10^{-2}	–	[1]

Table 2 (*Continued*).

ionophore	membrane composition	$\lg K_{SCN^-,X^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
SCN⁻-6	**SCN⁻-6** (*w* = 3 %), PVC (*w* = 48 %), DMSNE (*w* = 49 %)	HCO_3^-, –2.1; NO_3^-, –3.7; HPO_4^{2-}, –4.4; SO_4^{2-}, –4.8; Cl^-, –3.5; ClO_4^-, –2.6; Br^-, –2.9; I^-, –1.9; AcO^-, –4.3	SSM	0.1	0.1	–	10^{-3}–10^{-1}	21 ± 1 °C; pH = 7.50 ± 0.04; r.o.o.g.	[2]
	SCN⁻-6 (*w* = 20 %), PVC (*w* = 40 %), DMSNE (*w* = 40 %)	HCO_3^-, –3.5; NO_3^-, –3.3; HPO_4^{2-}, –5.3; SO_4^{2-}, –5.6; Cl^-, –3.8; ClO_4^-, –2.6; Br^-, –3.4; I^-, –2.5; AcO^-, –4.5	SSM	0.1	0.1	–61.9 ± 2.7	10^{-3}–10^{-1}	21 ± 1 °C; pH = 7.50 ± 0.04; r.o.o.g.	[2]
SCN⁻-7	**SCN⁻-7** (*w* = 1 %), PVC (*w* = 33 %), BBPA (*w* = 66 %)	NO_2^-, –0.35; Cl^-, –2.9; ClO_4^-, –2.4	SSM	0.1	0.1	–	$10^{-5.5}$–10^{-1}	20 ± 0.5 °C; pH = 7.45 ± 0.05; r.o.o.g.	[3]
SCN⁻-8	**SCN⁻-8** (*w* = 1 %), PVC (*w* = 33 %), BBPA (*w* = 66 %)	NO_2^-, –0.17; Cl^-, –3.3; ClO_4^-, –2.8	SSM	0.1	0.1	–	$10^{-5.5}$–10^{-1}	20 ± 0.5 °C; pH = 7.45 ± 0.05; r.o.o.g.	[3]
SCN⁻-9	**SCN⁻-9** (*w* = 1 %), PVC (*w* = 33 %), ETH 469 (*w* = 66 %)	HCO_3^-, –2.4; N_3^-, 0; NO_2^-, –0.2; NO_3^-, –3.4; F^-, –3.4; HPO_4^{2-}, –3.7; SO_4^{2-}, –3.9; Cl^-, –3.4; ClO_4^-, –2.6; Br^-, –3.2; I^-, –2.3; AcO^-, –3.4	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.40 ± 0.05; r.o.o.g.	[4]
	SCN⁻-9 (*w* = 1 %), PVC (*w* = 33 %), ETH 469 (*w* = 66 %)	HCO_3^-, –2.4; NO_2^-, –0.3; NO_3^-, –3.4; F^-, –3.4; HPO_4^{2-}, –3.7; SO_4^{2-}, –3.9; Cl^-, –3.4; ClO_4^-, –2.6; Br^-, –3.2; I^-, –2.3; AcO^-, –3.4	SSM	0.1	0.1	–	–	r.o.o.g. pH = 7.4 ± 0.1; 20 ± 1 °C	[5]
SCN⁻-10	**SCN⁻-10** (*w* = 1 %), PVC (*w* = 33 %), ETH 469 (*w* = 66 %)	HCO_3^-, –3.5; N_3^-, 0; NO_2^-, –1.1; NO_3^-, –3.3; F^-, –4.0; HPO_4^{2-}, –4.2; SO_4^{2-}, –3.9; Cl^-, –3.8; ClO_4^-, –1.8; Br^-, –3.4; I^-, –0.2; AcO^-, –3.9	SSM	0.1	0.1	–56.3 ± 6.7	$10^{-3.6}$–$10^{-2.5}$	20 ± 0.5 °C; pH = 7.40 ± 0.05; r.o.o.g	[4]

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Table 2 (*Continued*).

ionophore	membrane composition	$\lg K_{SCN^-,X^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	SCN⁻-10 (w = 1 %), PVC (w = 33 %), ETH 469 (w = 66 %)	HCO_3^-, –3.5; NO_2^-, –1.2; NO_3^-, –3.4; F^-, –4.0; HPO_4^{2-}, –4.2; SO_4^{2-}, –3.9; Cl^-, –3.9; ClO_4^-, –1.8; Br^-, –3.4; I^-, –0.2; AcO^-, –4.0	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
SCN⁻-11	**SCN⁻-11** (w = 1 %), PVC (w = 33 %), ETH 469 (w = 66 %)	HCO_3^-, –5.0; N_3^-, –0.5; NO_2^-, –3.0; NO_3^-, –3.6; F^-, –4.3; HPO_4^{2-}, –6.0; SO_4^{2-}, –7.1; Cl^-, –3.4; ClO_4^-, –2.1; Br^-, –3.1; I^-, –2.3; AcO^-, –5.2	SSM	0.1	0.1	–56.0 ± 0.7	$10^{-4.1}$–10^{-1}	20 ± 0.5 °C; pH = 7.50 ± 0.04; r.o.o.g.	[4]
	SCN⁻-11 (w = 1 %), PVC (w = 33 %), ETH 469 (w = 66 %)	HCO_3^-, –5.1; NO_2^-, –3.1; NO_3^-, –3.6; F^-, –4.2; HPO_4^{2-}, –5.8; SO_4^{2-}, –7.0; Cl^-, –3.4; ClO_4^-, –2.1; Br^-, –3.0; I^-, –2.4; AcO^-, –5.1	SSM	0.1	0.1	–	–	20 ± 0.5 °C;. pH = 7.4 ± 0.1; r.o.o.g.	[5]
SCN⁻-12	**SCN⁻-12** (w = 0.3 %), oNPOE (w = 99.7 %)	ClO_4^-, –2.7	SSM	0.1	0.1	–	–		[6]
SCN⁻-13	**SCN⁻-13** (w = 1 %), PVC (w = 33 %), ETH 469 (w = 66 %)	HCO_3^-, –5.0; NO_2^-, –1.7; NO_3^-, –3.4; F^-, –5.1; HPO_4^{2-}, –5.3; SO_4^{2-}, –5.3; Cl^-, –4.3; ClO_4^-, –1.3; Br^-, –3.2; I^-, –0.9; AcO^-, –5.0	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
SCN⁻-14	**SCN⁻-14** (w = 1 %), PVC (w = 33 %), DBS (w = 66 %)	CN^-, –3.2; Cl^-, –4.6; ClO_4^-, –2.3; Br^-, –3.8; I^-, –3.0; AcO^-, –4.2; ascorbate, < –3.7; citrate, < –3.7; succinate, < –3.7; salicylurate, –2.9; urate, < –3.7; Sal^-, –1.6	SSM	0.001	0.001	–64.1	10^{-6}–10^{-3}	pH = 5.5	[7]
		ClO_4^-, –1.8; ascorbate, < –2.4; citrate, <–2.4; Sal^-; –1.3; salicylurate, –2.9; urate, <–2.4	SSM	0.001	0.001			pH = 5.5; FIA	

Table 2 (*Continued*).

ionophore	membrane composition	$\lg K_{SCN^-,X^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
SCN⁻-15	**SCN⁻-15** (w = 1 %), PVC (w = 33 %), ETH 469 (w = 66 %)	HCO_3^-, –4.8; NO_2^-, –1.8; NO_3^-, –3.3; F^-, –5.1; HPO_4^{2-}, –5.4; SO_4^{2-}, –5.1; Cl^-, –4.6; ClO_4^-, –0.9; Br^-, –3.3; I^-, –0.2; AcO^-, –5.1	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
SCN⁻-16	**SCN⁻-16** (w = 1 %), PVC (w = 33 %), ETH 469 (w = 66 %)	HCO_3^-, –6.4; NO_2^-, –3.4; NO_3^-, –4.0; F^-, –6.0; HPO_4^{2-}, –7.2; SO_4^{2-}, –7.1; Cl^-, –4.0; ClO_4^-, –2.3; Br^-, –3.6; I^-, –2.6; AcO^-, –5.1	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN⁻-16 (w = 1 %), PVC (w = 33 %), DDS (w = 66 %)	NO_2^-, –2.80; NO_3^-, –3.29; Cl^-, –3.05; ClO_4^-, –2.34; Br^-, –2.70; I^-, –2.25; Sal^-, –0.76	SSM	–	–	–	10^{-5} – 10^{-1} 10^{-4} – 10^{-1}*	pH = 5.0; c_{dl}* = 3.2 × 10^{-5} M *, pH = 6.5	[8]
	SCN⁻-16 (w = 1 %), PVC (w = 33 %), DDS (w = 66 %)	NO_2^-, –2.8; NO_3^-, –3.5; Cl^-, –3.9; ClO_4^-, 2.2; Br^-, –3.1; I^-, –1.3	SSM	0.01	0.01	–57.0	10^{-5} – 10^{-1}	pH = 6.05; r.o.o.g.	[9]
SCN⁻-17	**SCN⁻-17** (w = 1 %), PVC (w = 33 %), ETH 469 (w = 66 %)	HCO_3^-, –5.1; NO_2^-, –2.9; NO_3^-, –3.8; F^-, –5.6; HPO_4^{2-}, –5.8; SO_4^{2-}, –6.0; Cl^-, –3.4; ClO_4^-, –2.3; Br^-, –3.1; I^-, –2.5; AcO^-, –4.7	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
SCN⁻-18	**SCN⁻-18** (w = 1 %), PVC (w = 33 %), oNPOE (w = 66 %)	HCO_3^-, –1.9; NO_2^-, –1.3; NO_3^-, –1.4; HPO_4^{2-}, –2.2; Cl^-, –1.4; ClO_4^-, –0.6; Br^-, –1.8; I^-, –1.0; AcO^-, –2.0	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN⁻-18 (w = 1 %), PVC (w = 33 %), oNPOE (w = 66 %), TOABr, (x_i = 10 %)	HCO_3^-, –5.2; NO_2^-, –3.1; NO_3^-, –3.3; F^-, –7.1; HPO_4^{2-}, –6.9; SO_4^{2-}, –7.4; Cl^-, –5.4; ClO_4^-, –0.3; Br^-, –4.1; I^-, –1.9; AcO^-, –6.4	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]

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Table 2 (*Continued*).

ionophore	membrane composition	$\lg K_{SCN^-,X^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
	SCN⁻-18 (w = 1 %), PVC (w = 33 %), oNPOE (w = 66 %), TOABr (x_i = 41 %)	HCO_3^-, –5.2; NO_2^-, –3.4; NO_3^-, –3.2; F^-, –7.7; HPO_4^{2-}, –7.8; SO_4^{2-}, –8.0; Cl^-, –5.6; ClO_4^-, –0.1; Br^-, –4.3; I^-, –1.9; AcO^-, –6.7	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN⁻-18 (w = 1 %), PVC (w = 33 %), oNPOE (w = 66 %), TOABr (x_i = 50 %)	HCO_3^-, –5.8; NO_2^-, –3.4; NO_3^-, –3.3; F^-, –7.8; HPO_4^{2-}, –8.3; SO_4^{2-}, –8.0; Cl^-, –5.6; ClO_4^-, –0.1; Br^-, –4.3; I^-, –1.9; AcO^-, –6.9	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN⁻-18 (w = 1 %), PVC (w = 33 %), oNPOE (w = 66 %), TOABr (x_i = 87 %)	HCO_3^-, –6.0; NO_2^-, –3.2; NO_3^-, –2.5; F^-, –7.5; HPO_4^{2-}, –7.5; SO_4^{2-}, –7.2; Cl^-, –5.0; ClO_4^-, +0.5; Br^-, –3.5; I^-, –1.2; AcO^-, –6.4	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN⁻-18 (w = 1 %), PVC (w = 33 %), oNPOE (w = 66 %), TOABr (x_i = 110 %)	HCO_3^-, –6.2; NO_2^-, –3.2; NO_3^-, –2.5; F^-, –7.5; HPO_4^{2-}, –7.5; SO_4^{2-}, –7.2; Cl^-, –5.0; ClO_4^-, +0.5; Br^-, –3.5; I^-, –1.2; AcO^-, –6.4	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN⁻-18 (w = 1 %), PVC (33 wt%), oNPOE (w = 66 %), TOABr (x_i = 201 %)	HCO_3^-, –5.7; NO_2^-, –3.3; NO_3^-, –2.0; F^-, –6.7; HPO_4^{2-}, –6.7; SO_4^{2-}, –6.3; Cl^-, –4.3; ClO_4^-, +1.2; Br^-, –2.9; I^-, –0.7; AcO^-, –6.0	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN⁻-18 (w = 1 %), PVC(w = 33 %), ETH 469 (w = 66 %)	HCO_3^-, –1.0; NO_2^-, –1.0; NO_3^-, –0.8; F^-, –1.3; HPO_4^{2-}, –0.8; SO_4^{2-}, –1.5; Cl^-, –1.0; ClO_4^-, +0.1; Br^-, –1.0; I^-, –0.7; AcO^-, –0.8;	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]

Table 2 (*Continued*).

ionophore	membrane composition	$\lg K_{SCN^-,X^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	SCN^--18 (w = 1 %), ETH 469 (w = 66 %), TOABr (x_i = 9 %). PVC (w = 33 %)	HCO_3^-, –4.3; NO_2^-, –3.0; NO_3^-, –2.2; F^-, –5.4; HPO_4^{2-}, –5.3; SO_4^{2-}, –5.5; Cl^-, –4.3; ClO_4^-, +0.6; Br^-, –3.1; I^-, –1.1; AcO^-, –5.2;	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN^--18 (w = 1 %), ETH 469 (w = 66 %), TOABr (x_i = 39 %), PVC (w = 33 %)	HCO_3^-, –5.0; NO_2^-, –3.3; NO_3^-, –2.4; F^-, –6.3; HPO_4^{2-}, –6.0; SO_4^{2-}, –6.2; Cl^-, –4.6; ClO_4^-, +0.6; Br^-, –3.3; I^-, –1.2; AcO^-, –5.7;	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN^--18 (w = 1 %), ETH 469 (w = 66 %), TOABr (x_i = 52 %), PVC (w = 33 %)	HCO_3^-, –5.4; NO_2^-, –3.3; NO_3^-, –2.4; F^-, –6.5; HPO_4^{2-}, –6.7; SO_4^{2-}, –6.5; Cl^-, –4.6; ClO_4^-, +0.6; Br^-, –3.3; I^-, –1.2; AcO^-, –6.0	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN^--18 (w = 1 %), ETH 469 (w = 66 %), TOABr (x_i = 89 %), PVC (w = 33 %)	HCO_3^-, –5.4; NO_2^-, –3.3; NO_3^-, –2.4; F^-, –6.8; HPO_4^{2-}, –6.9: SO_4^{2-}, –6.5; Cl^-, –4.6; ClO_4^-, +0.6; Br^-, –3.3; I^-, –1.2; AcO^-, –6.0	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN^--18 (w = 1 %), ETH 469 (w = 66 %), TOABr (x_i = 110 %), PVC(w = 33 %)	HCO_3^-, –6.0; NO_2^-, –3.2; NO_3^-, –2.4; F^-, –6.8; Cl^-, –4.7; ClO_4^-, +0.6; HPO_4^{2-}, –6.9; SO_4^{2-}, –6.5; Br^-, –3.3; I^-, –1.2; AcO^-, –6.1	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]
	SCN^--18 (w = 1 %), ETH 469 (w = 66 %), TOABr (x_i = 202 %), PVC(w = 33 %)	HCO_3^-, –5.6; NO_2^-, –3.2; NO_3^-, –2.2; F^-, –6.5; HPO_4^{2-}, –6.5; SO_4^{2-}, –6.1; Cl^-, –4.5; ClO_4^-, +0.9; Br^-, –3.1; I^-, –0.9; AcO^-, –5.9	SSM	0.1	0.1	–	–	20 ± 0.5 °C; pH = 7.4 ± 0.1; r.o.o.g.	[5]

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Table 2 (*Continued*).

ionophore	membrane composition	$\lg K_{SCN^-,X^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
SCN⁻-19	**SCN⁻-19** (w = 3 %), PVC (w = 32 %), oNPOE (w = 65 %)	NO_3^-, –3.63; Cl^-, –3.43; ClO_4^-, –0.85; Br^-, –2.24; I^-, –0.87; AcO^-, –4.18; $Benz^-$, –4.12	SSM	0.1	0.1	–58.0	10^{-6} – 10^{-1}	conditioned in 1 mM $Cu(SCN)_2$; t_{resp} < 5 s; pH = 7.4; $c_{dl} = 10^{-6}$ M	[10]
SCN⁻-20	**SCN⁻-20** (w = 3 %), PVC (w = 24 %), oNPOE (w = 73 %)	NO_2^-, –1.5; NO_3^-, –2.7; HPO_4^{2-}, –2.4; SO_4^{2-}, –4.4; Cl^-, –3.5; ClO_4^-, –2.0; Br^-, –3.2; I^-, –1.2	SSM	0.1	0.1	–55	10^{-4} – 10^{-1}		[11]
SCN⁻-21	**SCN⁻-21** (w = 1 %), PVC (w = 25 %), oNPOE (w = 74 %)	NO_2^-, –0.7; NO_3^-, –3.2; HPO_4^{2-}, –2.4; SO_4^{2-}, –5.2; Cl^-, –4.1; ClO_4^-, –2.0; Br^-, –3.7; I^-, –2.8	SSM	0.1	0.1	–55 (after 1 week) –49 (after 1.5 months)	10^{-4} – 10^{-1}		[11]
SCN⁻-22	**SCN⁻-22** (0.001 M), nitrobenzene	ClO_4^-, +0.8	SSM (bi-ionic potential)	–	–	–63.5	–		[12]
	SCN⁻-22 (0.001 M), 1,2-dichloroethane	ClO_4^-, +0.1	SSM (bi-ionic potential)	–	–	–	–		[12]
	SCN⁻-22 (0.001 M), chloroform	ClO_4^-, –1.8	SSM (bi-ionic potential)	–	–	–	–		[12]
SCN⁻-23	**SCN⁻-23** (0.001 M), 1,2-dichloroethane	NO_2^-, –1.9; NO_3^-, –2.0; F^-, –2.3; Cl^-, –3.0; ClO_4^-, +0.32; Br^-, –2.5; I^-, –0.95	SSM (bi-ionic potential)	–	–	–63.5	–	r.o.o.g.	[12]
	SCN⁻-23 (0.001 M), chloroform	NO_2^-, –1.4; NO_3^-, –2.4; F^-, –2.3; Cl^-, –2.6; ClO_4^-, –2.3; Br^-, –2.7; I^-, –2.2	SSM (bi-ionic potential)	–	–	–63.3	–	r.o.o.g.	[12]
SCN⁻-24	**SCN⁻-24** (w = 2 %), DOS (w = 66 %), epoxy resin (w = 32 %)	HCO_3^-, –2.4; NO_2^-, –2.2; NO_3^-, –2.4; F^-, –1.9; HPO_4^{2-}, –2.4; Cl^-, –1.90; ClO_4^-, –1.79; Br^-, –0.4; AcO^-, –2.3	MPM	–	–	–55 ± 2	$10^{-4.8}$ – $10^{-2.5}$	t_{resp} = 20 s; τ > 21 d; $c_{dl} = 1.9 \times 10^{-6}$ M	[[13]
SCN⁻-25	**SCN⁻-25** (w = 1 %), PVC (33 wt%), DDS (w = 66 %)	NO_2^-, –2.73; NO_3^-, –3.70; Cl^-, –3.04; ClO_4^-, –2.34; Br^-, –2.92; I^-, –2.17;	SSM	–	–	–53.0	10^{-6} – 10^{-1}	pH = 3.01; $c_{dl} = 3.98 \times 10^{-7}$ M 25 °C	[14]

Table 2 (*Continued*).

ionophore	membrane composition	$\lg K_{SCN^-,X^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
	SCN⁻-25 (w = 1 %), PVC (33 wt%), oNPOE (w = 66 %)	NO_2^-, –1.52; NO_3^-, –1.37 ; Cl^-, –2.02; ClO_4^-, –0.30; Br^-, –1.88; I^-, –0.58;	SSM	–	–	–43.0	10^{-6} – 10^{-1}	pH = 3.01; c_{dl} = 6.31 × 10^{-7} M 25 °C	[14]
	SCN⁻-25 (w = 1 %), PVC (33 wt%), DBP (w = 66 %)	NO_2^-, –2.00; NO_3^-, –2.30; Cl^-, –2.90; ClO_4^-, –0.60; Br^-, –2.50; I^-, –1.30	SSM	–	–	–58.0	10^{-4} – 10^{-1}	pH = 3.01; c_{dl} = 6.31 × 10^{-5} M 25 °C	[14]
SCN⁻-26	**SCN⁻-26** (w = 1 %), PVC (33 wt%), DDS (w = 66 %)	NO_2^-, –2.49; NO_3^-, –3.03; Cl^-, –2.91; ClO_4^-, –2.14; Br^-, –2.60; I^-, –2.00; Sal^-, –0.36	SSM	–	–	–	10^{-5} – 10^{-1} 10^{-3} – 10^{-1}*	pH = 5.0; c_{dl}* = 6.3 × 10^{-4} M; *, pH = 6.5	[8]
SCN⁻-27	**SCN⁻-27** (w = 1 %), PVC (33 wt%), DDS (w = 66 %)	NO_2^-, –2.81; NO_3^-, –3.26; Cl^-, –3.18; ClO_4^-, –2.40; Br^-, –2.80; I^-, –2.44; Sal^-, –1.00	SSM	–	–	–	10^{-5} – 10^{-1} 10^{-4} – 10^{-1}*	pH = 5.0; c_{dl}* = 2.0 × 10^{-5} M; *, pH = 6.5	[8]
SCN⁻-28	**SCN⁻-28** (w = 1 %), PVC (33 wt%), DDS (w = 66 %)	NO_2^-, –3.10; NO_3^-, –2.80; Cl^-, –4.20; ClO_4^-, –0.12; Br^-, –3.00; I^-, –1.60; Sal^-, –1.00	SSM	–	–	–	10^{-5} – 10^{-1}	pH = 5.0	[8]
	SCN⁻-28 (w = 1 %), PVC (33 wt%), DDS (w = 66 %)	NO_2^-, –3.0; NO_3^-, –2.7; Cl^-, –4.1; ClO_4^-, –0.11; Br^-, –3.0; I^-, –1.5	SSM	–	–	–	–	pH = 6.05; r.o.o.g.	[9]
SCN⁻-29	**SCN⁻-29** (w = 1 %), PVC (w = 33 %), DDS (w = 66 %)	NO_2^-, –2.8; NO_3^-, –3.1; Cl^-, –4.2; ClO_4^-, –1.6; Br^-, –3.4; I^-, –2.6;	SSM	–	–	–58.5	10^{-6} – 10^{-1}	pH = 5.0	[9]
SCN⁻-30	**SCN⁻-30** electropolymerized onto glassy-carbon electrodes in 0.10 M tetraethylammonium perchlorate	I^-, –3.3	MPM	–	–	–43	10^{-5} – $10^{-2.5}$	c_{dl} = 5 × 10^{-7} M; τ > 60 d	[15]
SCN⁻-31	**SCN⁻-31** (0.0001 M in oNPOE); TOMACl (x_i = 10000 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +4.2; NO_2^-, +1.0; NO_3^-, +2.3; ClO_4^-, +5.5	SSM	0.1	0.1	N	10^{-3} – 10^{-1}	K was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.0005 M in oNPOE); TOMACl (x_i = 2000 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +4.2; NO_2^-, +1.0; NO_3^-, +2.3; ClO_4^-, +5.5	SSM	0.1	0.1	N	10^{-3} – 10^{-1}	K was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.001 M in oNPOE); TOMACl (x_i = 1000 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +4.2; NO_2^-, +1.0; NO_3^-, +2.3; ClO_4^-, +5.5	SSM	0.1	0.1	N	10^{-3} – 10^{-1}	K was obtained as K_{Cl^-,X^-}.	[16]

(*continues on next page*)

Table 2 (*Continued*).

ionophore	membrane composition	$\lg K_{SCN^-,X^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	SCN⁻-31 (0.003 M in oNPOE); TOMACl (x_i = 330 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +4.5; NO_2^-, +1.0; NO_3^-, +1.0; ClO_4^-, +4.8	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}	[16]
	SCN⁻-31 (0.01 M in oNPOE); TOMACl (x_i = 100 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.5; NO_2^-, +1.0; NO_3^-, +0.4; ClO_4^-, +3.8	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.02 M in oNPOE); TOMACl (x_i = 50 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.5; NO_2^-, +1.0; NO_3^-, +0.3; ClO_4^-, +2.9	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.05 M in oNPOE); TOMACl (x_i = 20 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.5; NO_2^-, +1.0; NO_3^-, +0.1; ClO_4^-, +2.3	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.1 M in oNPOE); TOMACl (x_i = 10 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.5; NO_2^-, +1.1; NO_3^-, +0.0; ClO_4^-, +2.0	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.0001 M in oNPOE); TOMACl (x_i = 3000 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +4.2; NO_2^-, +1.0; NO_3^-, +2.4; ClO_4^-, +5.5	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.0005 M in oNPOE); TOMACl (x_i = 600 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +4.5; NO_2^-, +1.0; NO_3^-, +2.0; ClO_4^-, +5.2	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.001 M in oNPOE); TOMACl (x_i = 300 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.0; NO_2^-, +1.0; NO_3^-, +2.0; ClO_4^-, +5.0	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.003 M in oNPOE); TOMACl (x_i = 100 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.5; NO_2^-, +1.0; NO_3^-, +1.0; ClO_4^-, +4.2	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}	[16]
	SCN⁻-31 (0.005 M in oNPOE); TOMACl (x_i = 60 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.6; NO_2^-, +1.0; NO_3^-, +0.8; ClO_4^-, +4.0	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-} .	[16]
	SCN⁻-31 (0.01 M in oNPOE); TOMACl (x_i = 33 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.5; NO_2^-, +1.0; NO_3^-, +0.5; ClO_4^-, +3.7	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}	[16]
	SCN⁻-31 (0.05 M in oNPOE); TOMACl (x_i = 6 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.2; NO_2^-, +1.0; NO_3^-, +0.2; ClO_4^-, +2.2	SSM	0.1	0.1	N	$10^{-3} - 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]

Table 2 (*Continued*).

ionophore	membrane composition	$\lg K_{SCN^-,X^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	SCN⁻-31 (0.00005 M in oNPOE); TOMACl (x_i = 2000 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +4.1; NO_2^-, +1.0; NO_3^-, +2.4; ClO_4^-, +5.2	SSM	0.1	0.1	N	$10^{-3} – 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.0001 M in oNPOE); TOMACl (x_i = 1000 %), oNPOE (1 mL), PVC (0.4 g)	NO_2^-, +1.0; NO_3^-, +2.0; ClO_4^-, +4.8	SSM	0.1	0.1	N	$10^{-3} – 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.005 M in oNPOE); TOMACl (x_i = 200 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +4.8; NO_2^-, +1.0; NO_3^-, +1.7; ClO_4^-, +4.4	SSM	0.1	0.1	N	$10^{-3} – 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.001 M in oNPOE); TOMACl (x_i = 100 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.2; NO_2^-, +1.0; NO_3^-, +1.5; ClO_4^-, +4.3	SSM	0.1	0.1	N	$10^{-3} – 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}	[16]
	SCN⁻-31 (0.002 M in oNPOE); TOMACl (x_i = 50 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.5; NO_2^-, +1.0; NO_3^-, +1.0; ClO_4^-, +3.9	SSM	0.1	0.1	N	$10^{-3} – 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.003 M in oNPOE); TOMACl (x_i = 330 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.5; NO_2^-, +1.0; NO_3^-, +0.9; ClO_4^-, +3.8	SSM	0.1	0.1	N	$10^{-3} – 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}	[16]
	SCN⁻-31 (0.005 M in oNPOE); TOMACl (x_i = 20 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.5; NO_2^-, +1.0; NO_3^-, +0.7; ClO_4^-, +3.7	SSM	0.1	0.1	N	$10^{-3} – 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
	SCN⁻-31 (0.01 M in oNPOE); TOMACl (x_i = 20 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +5.5; NO_2^-, +1.0; NO_3^-, +0.3; ClO_4^-, +2.0	SSM	0.1	0.1	N	$10^{-3} – 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}	[16]
	SCN⁻-31 (0.05 M in oNPOE); TOMACl (x_i = 2 %), oNPOE (1 mL), PVC (0.4 g)	SCN^-, +4.5; NO_2^-, +1.0; NO_3^-, +0.3; ClO_4^-, +1.5	SSM	0.1	0.1	N	$10^{-3} – 10^{-1}$	*K* was obtained as K_{Cl^-,X^-}.	[16]
SCN⁻-32	**SCN⁻-32** (w = 1.3 %), oNPOE (w = 65.8 %), PVC (w = 32.9 %)	SCN^-, +2.3; NO_2^-, +0.6; NO_3^-, –3.6; Cl^-, 1.4; Br^-, –0.3; I^-, +1.6	SSM (E_A=E_B)	–	0.01 10^{-4} (SCN^-, I^-)		10^{-6}–10^{-2}	*K* was obtained as $K_{ClO_4^-,X^-}$.	[17]
SCN⁻-33	**SCN⁻-33** (w = 1.3 %), oNPOE (w = 65.8 %), PVC (w = 32.9 %)	SCN^-, +2.0; NO_2^-, +0.1; NO_3^-, –3.6; Cl^-, –2.0; Br^-, –1.0; I^-, +0.8	SSM (E_A=E_B)	–	0.01 10^{-4} (SCN^-, I^-)		10^{-6}–10^{-2}	*K* was obtained as $K_{ClO_4^-,X^-}$.	[17]

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Table 2 (*Continued*).

ionophore	membrane composition	$\lg K_{SCN^-,X^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
SCN^--34	**SCN^--34** (w = 1.3 %), DDS (w = 66.5 %), PVC (w = 32.2 %)	borate, –3.75; OH^-, –0.47; NO_2^-, –0.98; NO_3^-, –3.71; F^-, –3.36; $H_2PO_4^-$, –4.08; SO_4^{2-}, –3.94; Cl^-, –3.69; ClO_4^-, –2.45; Br^-, –3.21; AcO^-, –3.72; citrate, –2.86	SSM	–	–	–60.2	2.0×10^{-6} –10^{-1}	pH = 4.0	[18]
	SCN^--34 (w = 1.3 %), oNPOE (w = 66.5 %), PVC (w = 32.2 %)	borate, –3.48; OH^-, –061; NO_2^-, –0.50; NO_3^-, –2.95; F^-, –3.0; $H_2PO_4^-$, –3.77; SO_4^{2-}, –3.73; Cl^-, –3.45; ClO_4^-, –0.89; Br^-, –3.05; AcO^-, –3.6; citrate, –2.14	SSM	–	–	–60.2	2.0×10^{-6} –10^{-1}	pH = 4.0	[18]

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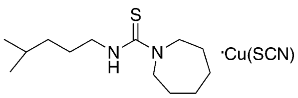
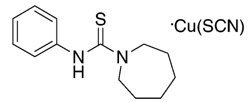
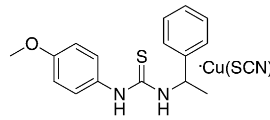
Table 2 (*Continued*).



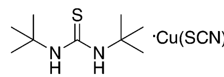
SCN⁻-1 (M_r = 242.43)



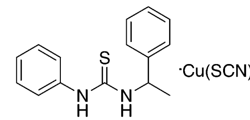
SCN⁻-2 (M_r = 234.36)



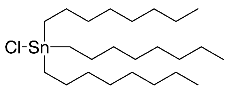
SCN⁻-3 (M_r = 286.39)



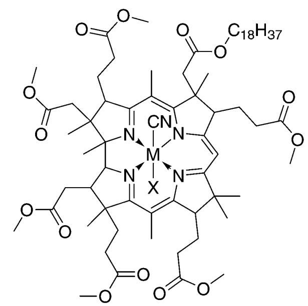
SCN⁻-4 (M_r = 188.33)



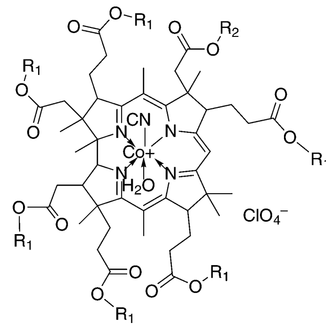
SCN⁻-5 (M_r = 256.37)



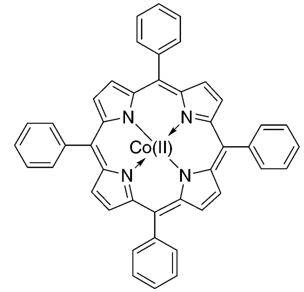
SCN⁻-6 (M_r = 493.82)



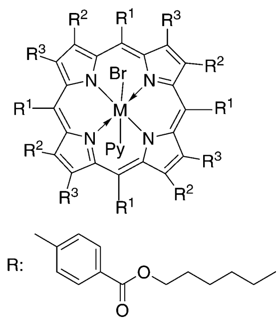
SCN⁻-7 (M_r = 1327.57): M=Co(III); X = CN^-



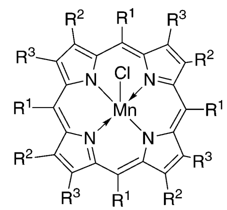
SCN⁻-8 (M_r = 1401.02): $R^1 = CH_3$; $R^2 = C_{18}H_{37}$
SCN⁻-9 (M_r = 1793.44): $R^1 = R^2 = CH_2CH_2C_6H_5$



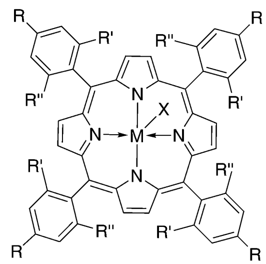
SCN⁻-12 (M_r = 671.65)



SCN⁻-10 (M_r = 1343.33): R^1=$C_6H_4C(O)OC_6H_{13}$; R^2,R^3=H
SCN⁻-13 (M_r = 1038.95): R^1=H; R^2=$C_6H_4C(O)OC_6H_{13}$; R^3=CH_3



SCN⁻-11 (M_r = 1215.79) :
$R^1 = C_6H_4C(O)OC_6H_{13}$; R^2, R^3 = H
SCN⁻-16 (M_r = 703.11) :
$R^1 = C_6H_5$; R^2, R^3 = H
SCN⁻-17 (M_r = 911.40) : R^1 = H;
$R^2 = (CH_2)_2C(O)OCH(CH_3)_2$, $R^3 = CH_3$



SCN⁻-14 (M_r = 1616.26) : M = Mn(III); R, R', R'' = C_6H_5; X = Cl^-
SCN⁻-20 (M_r = 729.74) : M = Co(III); R, R', R'' = H ; X = SCN^-
SCN⁻-21 (M_r = 1165.63) : M = Co(III); R'' = $NHC(O)C(CH_3)_3$; R, R' = H; X = ClO_4^-
SCN⁻-22 (M_r = 725.74) : M = Mn(III); R, R', R'' = H ; X = SCN^-

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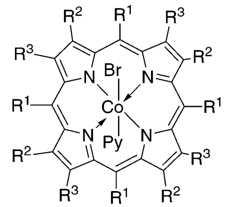
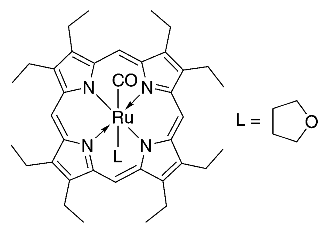
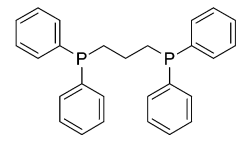


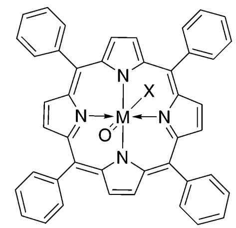
SCN⁻-15 (M_r = 1399.44) :
$R^1 = C_4H_6C(O)OC_6H_{13}$; R^2, R^3 = H



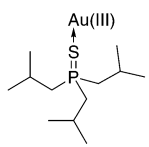
SCN⁻-18 (M_r = 733.95)



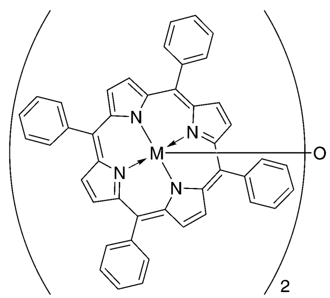
SCN⁻-19 (M_r = 412.44)



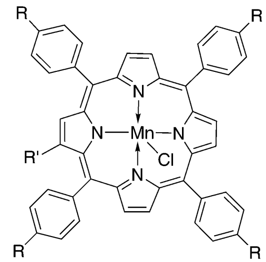
SCN⁻-23 (M_r = 782.74) : M = Mo(V); X = SCN⁻



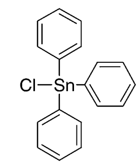
SCN⁻-24 (M_r = 431.35)



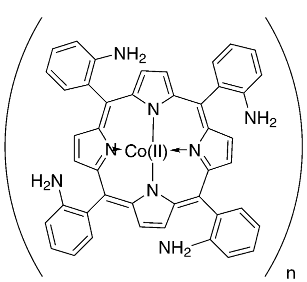
SCN⁻-25 (M_r = 1353.13): M = Fe
SCN⁻-29 (M_r = 1351.32): M = Mn



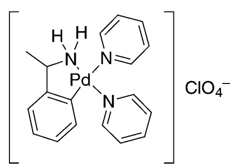
SCN⁻-26 (M_r = 823.21): R = OCH_3; R' = H
SCN⁻-27 (M_r = 748.11): R = H; R' = NO_2
SCN⁻-28 (M_r = 703.11) : R, R' = H, 2-imidazol



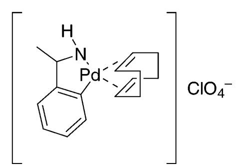
SCN⁻-31 (M_r = 385.47)



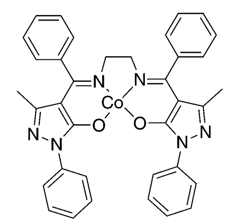
SCN⁻-30



SCN⁻-32 (M_r = 483.01)



SCN⁻-33 (M_r = 433.02)



SCN⁻-34 (M_r = 655.63)

Table 3 NO_2^--selective electrodes.

ionophore	membrane composition	$\lg K_{NO_2^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
NO_2^--1	**NO_2^--1** (w = 1 %), ETH 469 (w = 66 %), PVC (w = 33 %)	HCO_3^-, –2.2; SCN^-, +0.2; N_3^-, +0.2; NO_3^-, –3.2; F^-, –3.2; SO_4^{2-}, –3.7; Cl^-, –3.2; ClO_4^-, –2.3; Br^-, –3.0; I^-, –2.1; AcO^-, –3.2	SSM	0.1	0.1	–56.9 ± 1.3; –57.3 ± 1.7 (after 35 days)	$10^{-4.5}$–$10^{-1.0}$ $10^{-4.5}$–$10^{-1.0}$	$c_{dl} = 10^{-4.6}$M; t_{90} = 0.9 ± 0.3 s; t_{1mV} = 3.9 ± 1.3 s; ($10^{-2.5}$M–$10^{-1.5}$M); τ > 35 d; pH = 7.35 ± 0.05; r.o.o.g.	[1]
		NO_3^-, –4.2; Cl^-, –4.6	FIM*	–	1			*, in unbuffered soln.	
	NO_2^--1 (w = 1 %), ETH 469 (w = 66 %), PVC (w = 33 %)	HCO_3^-, –2.2; SCN^-, +0.2; N_3^-, +0.2; NO_3^-, –3.2; F^-, –3.2; SO_4^{2-}, –3.7; Cl^-, –3.2; ClO_4^-, –2.3; Br^-, –3.0; I^-, –2.1; AcO^-, –3.2	SSM	0.1	0.1	–56.9 ± 1.3	$10^{-4.5}$–$10^{-1.0}$	20 ± 0.5 °C; pH = 7.40 ± 0.05; r.o.o.g.	[2,3]
	NO_2^--1 (w = 1.0 %), oNPOE (w = 66 %), PVC (w = 33 %)	HCO_3^-, –3.3; SCN^-, +0.4; NO_3^-, –2.7; F^-, –3.2; SO_4^{2-}, –3.1; Cl^-, –3.0; ClO_4^-, –1.0; Br^-, –2.7; I^-, –1.6; AcO^-, –3.0	SSM	0.1	0.1	–55.0 ± 0.8; –38.1 ± 8.1*	10^{-5}–10^{-1} 10^{-5}–10^{-1}*	22 ± 1 °C *, 60 d old membrane	[4]
	NO_2^--1 (w = 1 %), KTFPB (x_i =10.9 %), oNPOE (w = 65.94 %), PVC (w = 33 %)	HCO_3^-, –3.5; SCN^-, +0.3; NO_3^-, –3.4; F^-, –3.9; SO_4^{2-}, –4.4; Cl^-, –3.7; ClO_4^-, –1.8; Br^-, –3.3; I^-, –2.3; AcO^-, –4.0	SSM	0.1	0.1	–58.3 ± 2.1; –52.4 ± 2.5*	10^{-5}–10^{-1} 10^{-5}–10^{-1}*	22 ± 1 °C *, 60 d old membrane	[4]
	NO_2^--1 (w = 1 %), KTFPB (x_i = 36.6 %), oNPOE (w = 65.82 %), PVC (w = 33 %)	HCO_3^-, –3.7; SCN^-, +0.2; NO_3^-, –3.5; F^-, –3.9; SO_4^{2-}, –4.1; Cl^-, –3.7; ClO_4^-, –2.2; Br^-, –3.3; I^-, –2.2; AcO^-, –3.8	SSM	0.1	0.1	–56.3 ± 0.4; –55.4 ± 1.3*	10^{-5}–10^{-1} 10^{-5}–10^{-1}*	22 ± 1 °C *, 60 d old membrane	[4]
	NO_2^--1 (w = 1 %), KTFPB (x_i = 60.0 %), oNPOE (w = 65.57 %), PVC (w = 33 %)	HCO_3^-, –3.3; SCN^-, +0.2; NO_3^-, –3.6; F^-, –3.7; SO_4^{2-}, –4.1; Cl^-, –3.7; ClO_4^-, –2.4; Br^-, –3.3; I^-, –2.2; AcO^-, –3.8	SSM	0.1	0.1	–58.0 ± 0.60; –55.2 ± 1.6*	10^{-5}–10^{-1} 10^{-5}–10^{-1}*	22 ± 1 °C *, 60 d old membrane	[4]

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Table 3 (*Continued*).

ionophore	membrane composition	$\lg K_{NO_2^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	NO_2^--1 (w = 1 %), KTFPB (x_i = 88.0 %), oNPOE (w = 65.57 %), PVC (w = 33 %)	HCO_3^-, –2.8; NO_3^-, –3.3; F^-, –3.3; SO_4^{2-}, –3.4; Cl^-, –3.3; ClO_4^-, –2.5; Br^-, –3.2; I^-, –2.0; AcO^-, –3.2	SSM	0.1	0.1	–55.4 ± 0.3	10^{-5}–10^{-1}	22 ± 1 °C	[4]
	NO_2^--1 (w = 1 %), TDDMACl (x_i = 48.8 %), oNPOE (w = 65.85 %), PVC (w = 33 %)	HCO_3^-, –2.3; SCN^-, +2.8; NO_3^-, +1.0; F^-, –2.5; SO_4^{2-}, –2.5; Cl^-, –1.1; ClO_4^-, +3.7; Br^-, +0.1; I^-, +2.3; AcO^-, –2.1	SSM	0.1	0.1	–42.8 ± 2.8	10^{-5}–10^{-1}	22 ± 1 °C; r.o.o.g.	[4]
	NO_2^--1 (w = 1.0 %), KTFPB(x_i = 37 %), oNPOE (w = 65.9 %), PVC (w = 32.9 %)	HCO_3^-, –3.7; SCN^-, +0.2; NO_3^-, –3.3; F^-, –3.9; SO_4^{2-}, –4.1; Cl^-, –3.7; ClO_4^-, –2.2; Br^-, –3.3; I^-, –2.2; AcO^-, –3.8	SSM	0.1	0.1	–56.3 ± 0.4* -54.1 ± 0.9**	10^{-5}–10^{-1}* 10^{-4}–10^{-1}**	22 ± 1 °C; c_{dl}* = $10^{-5.4 \pm 0.1}$M c_{dl}** = $10^{-4.8 \pm 0.1}$M; *, in unbuffered soln.; **, in 1 M NaCl ; r.o.o.g.	[5]
		Cl^-, –4.6 ± 0.1	FIM	–	0.1				
	NO_2^--1 (w = 6.3 %), NaTPB (x_i = 75 %), oNPOE (w = 82.8%), PVC (w = 10 %)	HCO_3^-, –4; NO_3^-, –4.5; Cl^-, –4.5	FIM	–	0.01 (HCO_3^-,– pH 8.0, NO_3^-) 0.6 (Cl^-)		–	c_{dl} = 10^{-6} M; t_{90} = 10–15 s; microelectrode, 15-μm tip	[6]
NO_2^--2	**NO_2^--2** (w = 1 %), BBPA (w = 66 %), PVC (w = 33 %)	HCO_3^-, –2.2; SCN^-, +0.2; N_3^-, +0.2; NO_3^-, –3.2; F^-, –3.2; SO_4^{2-}, –3.6; Cl^-, –3.2; ClO_4^-, –2.4; Br^-, –3.0; I^-, –2.1; AcO^-, –3.1	SSM	0.1	0.1	–	–	r.o.o.g.	[1]
		Cl^-, –4.8	FIM	–	1				
NO_2^--3	**NO_2^--3** (w = 1.0 %), ETH 469 (w = 66 %), PVC (w = 33 %)	HCO_3^-, –2.4; SCN^-, +1.1; NO_3^-, –2.2; F^-, –2.9; HPO_4^{2-}, –3.1; SO_4^{2-}, –2.8; Cl^-, –2.8; ClO_4^-, –0.7; Br^-, –2.3; I^-, +0.9; AcO^-, –2.9	SSM	0.1	0.1	–42.3 ± 2.7	$10^{-3.6}$–$10^{-2.0}$	20 ± 0.5 °C; pH = 7.40 ± 0.05; r.o.o.g.	[2,3]
NO_2^--4	**NO_2^--4** (w = 1–3 %), oNPOE (w = 69 %), PVC (w = 28–30%)	ClO_4^-, –1.6	–	–	–	–	–		[7]

Table 3 (*Continued*).

ionophore	membrane composition	$\lg K_{NO_2^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	NO_2^--4 (w = 1 %), TDDMACl (x_i = 10 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.0; NO_3^-, –2.6; Cl^-, –4.0; ClO_4^-, +0.2; Br^-, –3.2; Sal^-, –1.0	SSM	0.1	0.1	–58.4 ± 0.2	–	new membranes; 22 ± 2 °C; 4.0 < pH < 5.5; $c_{dl} = 10^{-5.1 \pm 0.1}$ M; pH = 5.2	[8]
		SCN^-, +1.2; NO_3^-, –2.2; Cl^-, –3.7; ClO_4^-, +0.8; Br^-, –2.8; Sal^-, –0.4	SSM	0.1	0.1	–57.2 ± 0.3*	–	*, 2 months old membranes; $c_{dl} = 10^{-4.8 \pm 0.1}$ M*; 22 ± 2 °C; pH = 5.2	
NO_2^--5	**NO_2^--5** (w = 1.0 %), ETH 469 (w = 66 %), PVC (w = 33 %)	HCO_3^-, –3.3; SCN^-, +1.7; NO_3^-, –1.8; F^-, –3.4; HPO_4^{2-}, –3.8; SO_4^{2-}, –3.8; Cl^-, –2.6; ClO_4^-, +0.5; Br^-, –1.6; I^-, +0.8; AcO^-, –3.3	SSM	0.1	0.1	–	–	20 ± 1 °C; pH = 7.4 ± 0.1; r.o.o.g.	[3]
NO_2^--6	**NO_2^--6** (w = 1.0 %), ETH 469 (w = 66 %), PVC (w = 33 %)	HCO_3^-, –3.1; SCN^-, +1.8; NO_3^-, –1.6; F^-, –3.4; HPO_4^{2-}, –3.7; SO_4^{2-}, –3.3; Cl^-, –2.7; ClO_4^-, +0.8; Br^-, –1.6; I^-, +2.0; AcO^-, –3.3	SSM	0.1	0.1	–	–	20 ± 1 °C; pH = 7.4 ± 0.1; r.o.o.g.	[3]
NO_2^--7	**NO_2^--7** (w = 0.27–0.53 %), DOA (w = 66 %), PVC (w = 33 %)	OH^-, +3.7; OH^-, +3.0; $H_2PO_4^-$, –3.7; HPO_4^{2-}, –3.2; Cl^-, –3.3; Br^-, –1.8; Br^-, –1.8	FIM	– – – – – – –	pH 9.3 pH 9.01 0.2 (pH 4.24) 0.1 (pH 7.2) 0.1 0.01 0.1	–57 –	10^{-5}–10^{-1}	19 or 24 °C	[9]
NO_2^--8	**NO_2^--8** (w = 1 %), DOS (w = 66 %), PVC (w = 33 %)	HCO_3^{2-}, –3.2; SCN^-, +2.7; HPO_4^{2-}, –3.5; ClO_4^-, –2.2; Br^-, –2.7; I^-, –2.2; benzoate, –3.0; Sal^-, +3.8	MPM	c :10^{-4}	–	–	–	pH = 6.6	[10]

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Table 3 (*Continued*).

ionophore	membrane composition	$\lg K_{NO_2^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
NO_2^--9	**NO_2^--9** (w = 9.1 %), KTpClPB (x_i = 52 %), oNPOE (w = 77.9 %), PVC (w = 11.3 %)	HCO_3^-, –1.7; NO_3^-, –2.3; F^-, –2.5; HPO_4^{2-}, –2.7; SO_4^{2-}, –2.9; Cl^-, –2.5; AcO^-, –2.4	SSM	0.1	0.1	–44.9 ± 5.1* –42.2 ± 4.7**	10^{-4}–10^{-1} 10^{-3}–10^{-1}	22 ± 1 °C; pH = 7.4; c_{dl}* = $10^{-5.1 \pm 0.7}$ M; c_{dl}** = $10^{-4.2 \pm 0.5}$ M; *, in unbuffered soln; **, in 0.1 M NaCl; r.o.o.g.; microelectrode	[5]
		Cl^-, –3.1 ± 0.4	FIM	–	0.1				
	NO_2^--9 (w = 8.5 %), KTpClPB (x_i = 30 %), oNPOE (w = 79.5 %), PVC (w = 11.1 %)	Cl^-, –2.5 ± 0.5	FIM	–	0.1	–34.8 ± 9.6	10^{-3}–10^{-1}	22 ± 1 °C; pH = 7.4; c_{dl}* = $10^{-4.9 \pm 0.4}$ M; c_{dl}** = $10^{-3.7 \pm 0.5}$ M; *, in unbuffered soln; **, in 0.1 M NaCl; r.o.o.g.; microelectrode	[5]
NO_2^--10	**NO_2^--10** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +0.8; NO_3^-, –1.8; Cl^-, –1.9; ClO_4^-, –0.4; Sal^-, –0.5	SSM	0.01	0.01	–47; –23*	–	22 ± 2 °C; pH = 5.5 *, 4 d old membrane	[11]
	NO_2^--10 (w = 0.92 %), TDDMACl (x_i =10 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.0; NO_3^-, –2.2; Cl^-, –3.2; ClO_4^-, + 0.1; Sal^-, –0.9	SSM	0.01	0.01	–57	–	22 ± 2 °C; pH = 5.5; τ > 2 weeks	[11]
	NO_2^--10 (w = 0.82 %), TDDMACl (x_i = 26 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.0; NO_3^-, –2.3; Cl^-, –3.3; ClO_4^-, + 0.3; Sal^-, –0.9	SSM	0.01	0.01	–57	–	22 ± 2 °C; pH = 5.5; τ > 2 weeks	[11]
	NO_2^--10 (w = 0.75 %), TDDMACl (x_i = 39 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.1; NO_3^-, –2.1; Cl^-, –3.6; ClO_4^-, +0.6; Sal^-, –0.7	SSM	0.01	0.01	–60	–	22 ± 2 °C; pH = 5.5; τ > 2 weeks	[11]
	NO_2^--10 (w = 0.70 %), TDDMACl (x_i = 52 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.1; NO_3^-, –2.1; Cl^-, –3.6; ClO_4^-, +0.6; Sal^-, –0.7	SSM	0.01	0.01	–60	–	22 ± 2 °C; pH = 5.5; τ > 2 weeks	[11]
	NO_2^--10 (w = 0.6 %), TDDMACl (x_i = 80 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.7; NO_3^-, 0.0; Cl^-, –1.7; ClO_4^-, +2.7; Sal^-, +1.2	SSM	0.01	0.01	–26	–	22 ± 2 °C; pH = 5.5; τ > 2 weeks	[11]

Table 3 (*Continued*).

ionophore	membrane composition	$\lg K_{NO_2^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
NO_2^--11	**NO_2^--11** (w = 2.5 %), DBP (w = 66.5 %), PVC (w = 31 %)	SCN^-, –1.04; NO_3^-, –3.05; Cl^-, –3.50; ClO_4^-, –1.62; Br^-, –2.89; I^-, –1.56	SSM	0.1	0.1	–57	10^{-5}–10^{-1}	pH = 3.5	[12]
	NO_2^--11 (w = 2.5 %), HTOAI (x_i = 2 %), DBP (w = 66.5 %), PVC (w = 31 %)	SCN^-, –0.19; NO_3^-, –2.87; Cl^-, –3.00; ClO_4^-, –0.24; Br^-, –1.46; I^-, –0.21	SSM	0.1	0.1	–	–	pH = 3.5: t_{90} = several sec. –2 min; 3.5 < pH < 5.5	[12]
NO_2^--12	**NO_2^--12** (w = 2.5 %), DBP (w = 66.5 %), PVC (w = 31 %)	SCN^-, –0.56; NO_3^-, –2.91; Cl^-, –3.34; ClO_4^-, –2.24; Br^-, –2.38; I^-, –0.60; AcO^-, –4.10	SSM	0.1	0.1	–52.0	$10^{-5.3}$–$10^{-1.2}$	pH = 5.00 ± 0.05; t_{resp} = several sec. –3 min.	[13]
NO_2^--13	**NO_2^--13** (w = 1 %), DDS (w = 66 %), PVC (w = 33 %)	SCN^-, –0.74; NO_3^-, –2.98; F^-, –1.57; Cl^-, –1.74; ClO_4^-, –2.68; Br^-, –1.65; I^-, –1.52	SSM	–	–	–	–	pH = 5.5; 25 °C	[14]
NO_2^--14	**NO_2^--14** (w = 1 %), DDS (w = 66 %), PVC (w = 33 %)	SCN^-, –0.98; NO_3^-, –2.93; F^-, –1.20; Cl^-, –2.09; ClO_4^-, –2.36; Br^-, –1.40; I^-, –1.02	SSM	–	–	–	–	pH = 5.5; 25 °C	[14]
NO_2^--15	**NO_2^--15** (w = 1 %), DDS (w = 66 %), PVC (w = 33 %)	SCN^-, –1.0; NO_3^-, –2.65; F^-, –1.20; Cl^-, –1.85; ClO_4^-, –2.43; Br^-, –1.35; I^-, –1.03	SSM	–	–	–	–	pH = 5.5; 25 °C	[14]
NO_2^--16	**NO_2^--16** (w = 1 %), DDS (w = 66 %), PVC (w = 33 %)	SCN^-, +1.38; NO_3^-, –0.62; F^-, –0.30; Cl^-, –1.04; ClO_4^-, +1.76; Br^-, –0.54; I^-, +0.06	SSM	–	–	–	–	pH = 5.5; 25 °C	[14]
NO_2^--17	**NO_2^--17** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.1; NO_3^-, –2.0; Cl^-, –3.1; ClO_4^-, +0.3; Br^-, –2.7; I^-, +0.2; Sal^-, –0.2	SSM	0.1	0.1	–56.0	10^{-5}–10^{-2}	22 ± 2 °C	[8]
	NO_2^--17 (w = 1 %), TDDMACl (x_i = 9 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.2; NO_3^-, –2.3; Cl^-, –4.01; ClO_4^-, +0.7; Br^-, –3.1; I^-, –0.5; Sal^-, –0.2	SSM	0.1	0.1	–57.8	10^{-5}–10^{-1}	22 ± 2 °C	[8]

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Table 3 (*Continued*).

ionophore	membrane composition	$\lg K_{NO_2^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	NO_2^--17 (w = 1 %), TDDMACl (x_i = 18 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.2; NO_3^-, –2.3; Cl^-, –4.0; ClO_4^-, +0.8; Br^-, –3.0; I^-, –0.8; Sal^-, –0.2	SSM	0.1	0.1	–59.7	10^{-5}–10^{-1}	22 ± 2 °C	[8]
	NO_2^--17 (w = 1 %), TDDMACl (x_i = 40 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.1; NO_3^-, –2.1; Cl^-, –3.8; ClO_4^-, +0.8; Br^-, –2.7; I^-, –0.7; Sal^-, –0.3	SSM	0.1	0.1	–58.2	10^{-5}–10^{-1}	22 ± 2 °C	[8]
	NO_2^--17 (w = 1 %), TDDMACl (x_i = 70 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.2; NO_3^-, –1.7; Cl^-, –3.5; ClO_4^-, +1.1; Br^-, –2.2; I^-, –0.6; Sal^-, 0.0	SSM	0.1	0.1	–57.4	$10^{-4.5}$–10^{-1}	22 ± 2 °C	[8]
	NO_2^--17 (w = 1 %), TDDMACl (x_i = 70 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +2.0; NO_3^-, –0.4; Cl^-, –2.3; ClO_4^-, +2.3; Br^-, –1.0; I^-, +0.5; Sal^-, +0.7	SSM	0.1	0.1	–44.0	$10^{-3.5}$–10^{-1}	22 ± 2 °C	[8]
NO_2^--18	**NO_2^--18** (x_i = 1.0 %), oNPOE (w = 66 %), PVC (w = 33 %)	HCO_3^-, –3.6; SCN^-, +1.0; NO_3^-, –2.8; $H_2PO_4^-$, –3.8; SO $^{2-}$, –4.1; SO $^{2-}$, –3.4; Cl^-, –0.6; ClO_4^-, 0.0; Br^-, +0.6; I^-, +1.4; AcO^-, –4.0; Sal^-, +0.3	SSM	0.01	0.01	–74	10^{-5}–10^{-2}	25 °C; pH = 5.5 ± 0.01; c = $10^{-5.3}$ M; τ < 2 weeks; t_{resp} < 30 s; r.o.o.g.	[15]
	NO_2^--18 (w = 1.0 %), TDDMACl (x_i = 10 %), oNPOE (w = 66 %), PVC (w = 33 %)	HCO_3^-, –3.6; SCN^-, +0.4; NO_3^-, –2.8; $H_2PO_4^-$, –3.8; SO_3^{2-}, –3.7; SO_4^{2-}, –3.7; Cl^-, –1.3; ClO_4^-, +0.1; Br^-, 0.0; I^-, +0.8; AcO^-, –3.9; Sal^-, –0.5	SSM	0.01	0.01	–	–	25 °C; pH = 5.5 ± 0.01; 3.5 < pH < 12; r.o.o.g.	[15]
	NO_2^--18 (w = 1.0 %), TDDMACl (x_i = 20 %), oNPOE (w = 66 %), PVC (w = 33 %)	HCO_3^-, –4.1; SCN^-, +0.8; NO_3^-, –2.8; $H_2PO_4^-$, –3.8; SO_3^{2-}, –3.7; SO_4^{2-}, –3.9; Cl^-, –1.5; ClO_4^-, +0.2; Br^-, –0.3; I^-, +0.5; AcO^-, –4.1; Sal^-, –0.7	SSM	0.01	0.01	–	–	25 °C; pH = 5.5 ± 0.01; 3.5 < pH < 12; r.o.o.g.	[15]

Table 3 (*Continued*).

ionophore	membrane composition	$\lg K_{NO_2^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	NO_2^--18 (w = 1.0 %), TDDMACl (x_i = 30 %), oNPOE (w = 66 %), PVC (w = 33 %)	HCO_3^-, –3.9; SCN^-, +0.6; NO_3^-, –2.7; $H_2PO_4^-$, –3.7; SO_3^{2-}, –3.6; SO_4^{2-}, –4.1; Cl^-, –1.7; ClO_4^-, +0.1; Br^-, –0.4; I^-, +0.5; AcO^-, –4.0; Sal^-, –0.8	SSM	0.01	0.01	–	–	25 °C; pH = 5.5 ± 0.01; r.o.o.g.	[15]
	NO_2^--18 (w = 1.0 %), TDDMACl (x_i = 60 %), oNPOE (w = 66 %), PVC (w = 33 %)	HCO_3^-, –3.2; SCN^-, +1.3; NO_3^-, –1.6; $H_2PO_4^-$, –3.0; SO_3^{2-}, –2.8; SO_4^{2-}, –2.9; Cl^-, –1.3; ClO_4^-, +1.1; Br^-, –0.3; I^-, +1.0; AcO^-, –3.2; Sal^-, –0.1	SSM	0.01	0.01	–	–	25 °C; pH = 5.5 ± 0.01; r.o.o.g.	[15]
	NO_2^--18 (w = 1.0 %), TDDMACl (x_i = 130 %), oNPOE (w = 66 %), PVC (w = 33 %)	HCO_3^-, –0.7; SCN^-, +2.8; NO_3^-, +0.8; Cl^-, –0.2; ClO_4^-, +3.4; Br^-, +0.8; I^-, +2.4; AcO^-, –0.9; Sal^-, +2.3	SSM	0.01	0.01	–	–	25 °C; pH = 5.5 ± 0.01; r.o.o.g.	[15]
	NO_2^--18 (w = 1.0 %), KTFPB (x_i = 2 %), oNPOE (w = 66 %), PVC (w = 33 %)	HCO_3^-, –3.9; SCN^-, +0.8; NO_3^-, –2.7; Cl^-, –1.1; ClO_4^-, –0.1; Br^-, +0.3; I^-, +1.0; AcO^-, –3.7; Sal^-, –0.4	SSM	0.01	0.01	–	–	25 °C; pH = 5.5 ± 0.01; r.o.o.g.	[15]
	NO_2^--18 (w = 1.0 %), KTFPB (x_i = 10 %), oNPOE (w = 66 %), PVC (w = 33 %)	HCO_3^-, –1.8; SCN^-, +0.7; NO_3^-, –1.7; Cl^-, –0.7; ClO_4^-, –1.1; Br^-, +0.2; I^-, +0.7; AcO^-, –1.6; Sal^-, 0.0	SSM	0.01	0.01	–	–	25 °C; pH = 5.5 ± 0.01; r.o.o.g.	[15]
	NO_2^--18 (w = 1.0 %), DOS (w = 66 %), PVC (w = 33 %)	HCO_3^- –2.2; SCN^-, +1.5; NO_3^-, –2.0; Cl^-, –0.5; ClO_4^-, –1.3; Br^-, +0.7; I^-, +1.5; AcO^-, –2.2; Sal^-, 0.0	SSM	0.01	0.01	–	–	25 °C; pH = 5.5 ± 0.01; r.o.o.g.	[15]

(*continues on next page*)

Table 3 (*Continued*).

ionophore	membrane composition	$\lg K_{NO_2^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
	NO_2^--18 (w = 1.0 %), TDDMACl (x_i = 20 %), DOS (w = 66 %), PVC (w = 33 %)	HCO_3^-, –2.6; SCN^-, +1.4; NO_3^-, –2.1; Cl^-, –0.6; ClO_4^-, –0.4; Br^-, +0.5; I^-, +1.4; AcO^-, –2.6; Sal^-, +0.1	SSM	0.01	0.01	–	–	25 °C; pH = 5.5 ± 0.01; r.o.o.g.	[15]
	NO_2^--18 (w = 1.0 %), TDDMACl (x_i = 30 %), DOS (w = 66 %), PVC (w = 33 %)	HCO_3^-, –2.7; SCN^-, +1.1 NO_3^-, –1.8; Cl^-, –0.8; ClO_4^-, +0.3; Br^-, +0.4; I^-, +1.5, AcO^-, –2.6; Sal^-, +0.0	SSM	0.01	0.01	–	–	25 °C; pH = 5.5 ± 0.01; r.o.o.g.	[15]
NO_2^--19	**NO_2^--19** (w = 1.0 %), TDDMACl (x_i = 10 %), BBPA (w = 66 %), PVC (w = 33 %)	NO_3^-, –2.45; SO_4^{2-}, –2.75; ClO_4^-, –1.45; Br^-, –2.55;	SSM	0.1	0.1	–56.2*	10^{-3}–10^{-1}	pH = 4.5 ; τ > 6 weeks; *, in 0.1 M NO_3^-;	[16]
		NO_3^-, –2.40; SO_4^{2-}, –2.80; ClO_4^-, –1.80; Br^-, –2.50	FIM	–	–			r.o.o.g.	
	NO_2^--19 (w = 1.0 %), BBPA (w = 66 %), PVC (w = 33 %) TDDMACl (x_i = 5 %)	ClO_4^-, –0.1	SSM	0.1	0.1	–20.7	–	pH = 4.5 r.o.o.g.	[16]
	NO_2^--19 (w = 1.0 %), BBPA (w = 66 %), PVC (w = 33 %)	ClO_4^-, –0.1	SSM	0.1	0.1	–41.5	–	pH = 4.5 r.o.o.g.	[16]
	NO_2^--19 (w = 1.0 %), TDDMACl (x_i = 7.5 %), BBPA (w = 66 %), PVC (w = 33 %)	ClO_4^-, –1.0	SSM	0.1	0.1	–51.6	–	pH = 4.5 r.o.o.g.	[16]
	NO_2^--19 (w = 1.0 %), TDDMACl (x_i = 7.5 %), BBPA (w = 66 %), PVC (w = 33 %)	ClO_4^-, –0.8	SSM	0.1	0.1	–55.7	–	pH = 4.5 r.o.o.g.	[16]
	NO_2^--19 (w = 1.0 %), TDDMACl (x_i = 25 %), BBPA (w = 66 %), PVC (w = 33 %)	ClO_4^-, +1.0	SSM	0.1	0.1	–43.0	–	pH = 4.5 r.o.o.g.	[16]
	NO_2^--19 (w = 1.0 %), TDDMACl (x_i = 25 %), BBPA (w = 66 %), PVC (w = 33 %)	ClO_4^-, +1.1	SSM	0.1	0.1	–42.5	–	pH = 4.5 r.o.o.g.	[16]

Table 3 (*Continued*).

ionophore	membrane composition	$\lg K_{NO_2^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
	NO_2^--19 (w = 1.0 %), oNPOE (w = 66 %), PVC (w = 33 %)	NO_3^-, –1.8; $H_2PO_4^-$, –2.2; SO_4^{2-}, –2.1; Cl^-, –2.1; ClO_4^-, –0.7 Br^-, –1.0	SSM	0.1	0.1	–	–	pH = 4.5; r.o.o.g.	[16]
NO_2^--20	**NO_2^--20** (w = 1.0 %), BBPA (w = 66 %), PVC (w = 33 %)	NO_3^-, –2.8; $H_2PO_4^-$, –1.7; SO_4^{2-}, –3.0; Cl^-, –2.6; ClO_4^-, –0.2; Br^-, –1.6	SSM	0.1	0.1	–58*	–	pH = 4.5; *, in 0.1 M NO_3^-; r.o.o.g.	[16]
	NO_2^--20 (w = 1.0 %), oNPOE (w = 66 %), PVC (w = 33 %)	NO_3^-, –2.7; $H_2PO_4^-$, –2.0; SO_4^{2-}, –3.2; Cl^-, –2.6; ClO_4^-, +0.5; Br^-, –2.2	SSM	0.1	0.1	–	–	pH = 4.5; r.o.o.g.	[16]
NO_2^--21	**NO_2^--21** (w = 1.0 %), BBPA (w = 66 %), PVC (w = 33 %)	NO_3^-, –3.2; $H_2PO_4^-$, –3.7; SO_4^{2-}, –3.4; Cl^-, –3.4; ClO_4^-, +0.6; Br^-, –2.1	SSM	0.1	0.1	–53*	–	pH = 4.5; *, in 0.1 M NO_3^-; r.o.o.g.	[16]
NO_2^--22	**NO_2^--22** (w = 1.0 %), BBPA (w = 66 %), PVC (w = 33 %)	NO_3^-, –2.0; $H_2PO_4^-$, –1.7; SO_4^{2-}, –2.4; Cl^-, –2.1; ClO_4^-, +0.9; Br^-, –1.3	SSM	0.1	0.1	–	–	pH = 4.5; r.o.o.g.	[16]
NO_2^--23	**NO_2^--23** (w = 1.0 %), BBPA (w = 66 %), PVC (w = 33 %)	NO_3^-, –2.0; $H_2PO_4^-$, –2.8; SO_4^{2-}, –2.2; Cl^-, –2.2; ClO_4^-, +1.7; Br^-, –0.2	SSM	0.1	0.1	–	–	pH = 4.5; r.o.o.g.	[16]
NO_2^--24	**NO_2^--24** (w = 1.0 %), BBPA (w = 66 %), PVC (w = 33 %)	NO_3^-, –2.5; $H_2PO_4^-$, –3.6; SO_4^{2-}, –2.7; Cl^-, –2.4; ClO_4^-, +1.6; Br^-, –1.3	SSM	0.1	0.1	–	–	pH = 4.5; r.o.o.g.	[16]

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(10) S.A. O'Reilly, S. Daunert, L.G. Bachas, *Anal. Chem.*, **63**, 1278-1281 (1991).

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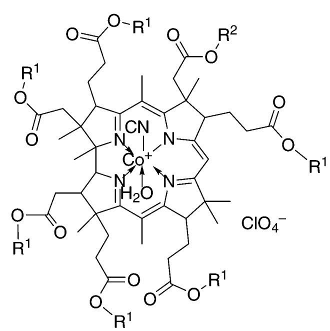
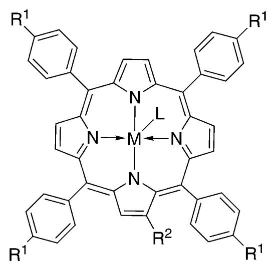
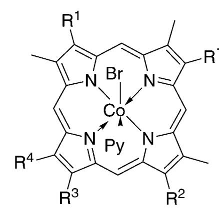
(16) W. Wróblewski, Z. Brzózka, D.M. Rudkevich, D.N. Reinhoudt, *Sens. Actuators B*, **37**, 151-155 (1996).



NO_2^--1 (M_r = 1793.44): $R^1 = R^2 = CH_2CH_2C_6H_5$
NO_2^--2 (M_r = 1401.02): $R^1 = CH_3$; $R^2 = C_{18}H_{37}$
NO_2^--9 (M_r = 1358.94): $R^1 = R^2 = C_3H_7$

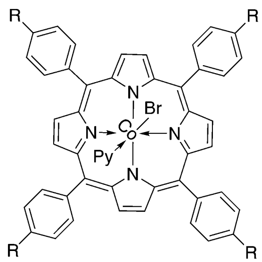


NO_2^--4 (M_r = 717.67): M = Co(III); $R^1 = R^2$ = H; L = NO_2
NO_2^--10 (M_r = 707.13): M = Co(III); $R^1 = R^2$ = H; L = Cl
NO_2^--13 (M_r = 773.56): M = In(III); $R^1 = OCH_3$; R^2 = H; L = Cl
NO_2^--14 (M_r = 808.00): M = In(III); R^1 = H; $R^2 = NO_2$; L = Cl
NO_2^--15 (M_r = 763.00): M = In(III); $R^1 = R^2$ = H; L = Cl
NO_2^--16 (M_r = 675.17): M = Al(III); $R^1 = R^2$ = H; L = Cl

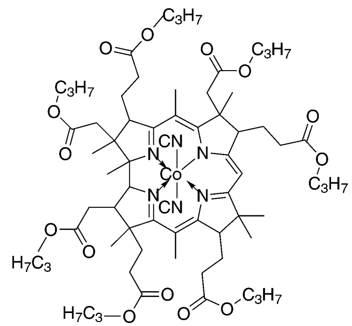


NO_2^--5 (M_r = 1038.96): $R^1 = R^2 = R^4$ = $CH_2CH_2COOCH(CH_3)_2$; $R^3 = CH_3$
NO_2^--6 (M_r = 1063.16): $R^1 = CH_2CH_3$; $R^2 = R^3 = CH_2CH_2COOC_{10}H_{21}$; $R^4 = CH_3$

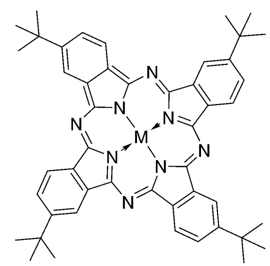
Table 3 (*Continued*).



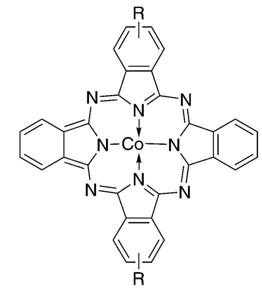
NO_2^--3 (M_r = 1343.35): R = $COOC_6H_{13}$
NO_2^--7 (M_r = 830.67): R = H



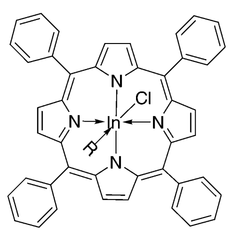
NO_2^--8 (M_r = 1285.51)



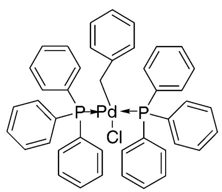
NO_2^--11 (M_r = 800.51): M = Co(II)



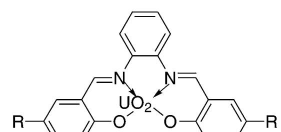
NO_2^--12 (M_r = 793.84): R = $CH_2NHC_6H_{11}$



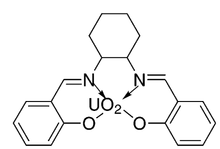
NO_2^--17 (M_r = 932.23): R = $C_6H_5CH_2C_5H_4N$



NO_2^--18 (M_r = 757.57)



NO_2^--19 (M_r = 674.37): R = NO_2
NO_2^--20 (M_r = 696.59): R = *tert*-Bu
NO_2^--21 (M_r = 584.37): R = H
NO_2^--22 (M_r = 612.42): R = CH_3
NO_2^--23 (M_r = 644.42): R = OCH_3



NO_2^--24 (M_r = 588.41)

Table 4 OH^--selective electrodes.

ionophore	membrane composition	$\lg K_{OH^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
OH^--1	**OH^--1** (w = 15 %), DOP (w = 40 %), PVC (w = 45 %)	NO_3^-, –2.99; F^-, –2.88; Cl^-, –2.05; Br^-, –2.16; I^-, –2.40	FIM	–	0.1	-57.3^{*} -60.9^{**} -64.9^{***}	$1.6\times10^{-5} - 2.0\times10^{-2*}$ $5.0\times10^{-6} - 1.8\times10^{-2**}$ $5.0\times10^{-6} - 2.6\times10^{-1***}$	t_{resp} < 10 ~15 s; *, 30 °C; **, 40 °C; ***, 45 °C	[1]
OH^--2	**OH^--2** (w = 1 %), DOA (w = 66 %), PVC (w = 33 %)	NO_2^-, +1.3; NO_3^-, –1.7; OH^-, +6.2; F^-, +0.1; SCN^-, 0; SO_3^{2-}, –2.0; SO_4^{2-}, –2.8; ClO_4^-, +1.7; Br^-, –2.3; I^-, –1.2	FIM	–	0.01	–54 ~ – 58		CWE; 25 ± 1 °C; τ > 150 d; r.o.o.g; K was obtained as $\lg K_{SCN^-,B^{n-}}$.	[2]

(1) A.F. Shoukry, H. Ibrahim, *J. Electroanal.Chem.*, **272**, 79-87 (1989).

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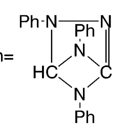
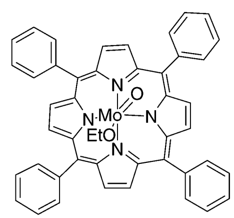
Nitron=


Nitron (M_r = 312.37)
OH^--1 = $(Nitron)_2HQS$
(HQS = 8-hydroxyquinoline-5-sulfonic acid)



OH^--2 (M_r = 769.72)

Table 5 HPO_4^{2-}-selective electrodes.

ionophore	membrane composition	$\lg K_{HPO_4^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
HPO_4^{2-}-1	**HPO_4^{2-}-1** (0.01 M), chloroform (80 %), decanol (20 %)	HCO_3^-, –2.5; NO_3^-, –2.5; $H_2PO_4^-$, +0.31; PO_4^{3-}, –3.0; SO_4^{2-}, –2.1; Cl^-, –1.0; ClO_4^-, –2.9; I^-, –0.8; AcO^-, –2.5	SSM (bi-ionic potential)	0.01	–	–	$10^{-4.3}$–10^{-1}	20 °C; 2 < pH < 10	[1]
HPO_4^{2-}-2	**HPO_4^{2-}-2** (0.01 M), chloroform (80 %), decanol (20 %)	HCO_3^-, –2.2; NO_3^-, –2.1; $H_2PO_4^-$, +1.0; PO_4^{3-}, –2.9; SO_4^{2-}, –1.6; Cl^-, –0.6; ClO_4^-, –2.7; I^-, –0.4; AcO^-, –2.1	SSM (bi-ionic potential)	0.01	–	–		20 °C; 2 < pH < 10	[1]
HPO_4^{2-}-3	**HPO_4^{2-}-3** (w = 20 %), DBS (w = 41 %), PVC (w = 39 %)	NO_3^-, +1.02; Cl^-, –0.04; Br^-, +0.34; I^-, +2.14; AcO^-, –0.10	FIM	–	1.21×10^{-3} (NO_3^-,I^-) 8.49×10^{-3} (Cl^-) 4.37×10^{-3} (Br^-) 1.03×10^{-3} (AcO^-)	–33.0 ± 0.1	$10^{-3.7}$–$10^{-1.9}$	25.0 °C; pH = 7.00 ± 0.01; $c_{dl} = 10^{-4.5 \pm 0.1}$ M	[2]
		SCN^-, +0.69; NO_3^-, –1.70; Cl^-, –2.51; Br^-, –1.80; I^-, –0.59; AcO^-, –2.30	SSM ($E_A = E_B$)	–	–	–33.0 ± 0.1	–	pH = 7.00 ± 0.01; $c_{dl} = 3.2 \times 10^{-5}$ M	[3]
		SCN^-, –0.93; NO_3^-, –2.95; Cl^-, –3.80; Br^-, -3.03; I^-, –2.23; AcO^-, –3.04	MPM	–	–	–20.1	$10^{-5.3}$–$10^{-4.2}$	pH = 7.00 ± 0.01; $c_{dl} = 10^{-6.4}$ M	[4]
HPO_4^{2-}-4	**HPO_4^{2-}-4** (w = 20 %), DBS (w = 41 %), PVC (w = 39 %)	SCN^-, +3.56; NO_3^-, –1.10; Cl^-, –0.40; Br^-, +0.64; I^-, +2.56; AcO^-, –0.71	SSM ($E_A = E_B$)	–	–	–29.8 ± 0.3	–	pH = 7.00 ± 0.01; $c_{dl} = 3.5 \times 10^{-4}$ M	[3]
HPO_4^{2-}-5	**HPO_4^{2-}-5** (w = 20 %), DBS (w = 41 %), PVC (w = 39 %)	SCN^-, +2.29; NO_3^-, +0.06; Cl^-, –0.08; Br^-, –0.21; I^-, +1.44; AcO^-, –1.03	SSM ($E_A = E_B$)	–	–	–32.2 ± 0.4	–	pH = 7.00 ± 0.01; $c_{dl} = 1.5 \times 10^{-4}$ M	[3]
HPO_4^{2-}-6	**HPO_4^{2-}-6** (w = 20 %), DBS (w = 41 %), PVC (w = 39 %)	SCN^-, –1.78; NO_3^-, –3.54; Cl^-, –4.19; Br^-, –3.13; I^-, –2.23; AcO^-, –3.19	MPM	–	–	–19.6	$10^{-5.3}$–$10^{-4.4}$	pH = 7.00 ± 0.01; $c_{dl} = 10^{-6.4}$ M	[4]
HPO_4^{2-}-7	**HPO_4^{2-}-7** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, –2.0; NO_3^-, –3.5; F^-, –3.6; SO_4^{2-}, –4.8; Cl^-, –4.2; ClO_4^-, –3.3; Br^-, –4.0; I^-, –3.3	SSM	9.09×10^{-3}	9.09×10^{-3}	–44.6	–	pH = 5.50; r.o.o.g.	[5]

(*continues on next page*)

Table 5 (*Continued*).

ionophore	membrane composition	$\lg K_{HPO_4^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
HPO_4^{2-}-8	**HPO_4^{2-}-8** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, –0.7; NO_3^-, –1.5; F^-, –1.2; SO_4^{2-}, –2.4; Cl^-, –1.6; ClO_4^-, –1.3; Br^-, –1.5; I^-, –1.2	SSM	9.09 × 10^{-3}	9.09 × 10^{-3}	–	–	pH = 5.50; r.o.o.g.	[5]
HPO_4^{2-}-9	**HPO_4^{2-}-9** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, –1.3; NO_3^-, –4.0; F^-, –2.9; SO_4^{2-}, –4.6; Cl^-, –3.1; ClO_4^-, –3.0; Br^-, –3.6; I^-, –2.7	SSM	9.09 × 10^{-3}	9.09 × 10^{-3}	–	–	pH = 5.50; r.o.o.g.	[5]
HPO_4^{2-}-10	**HPO_4^{2-}-10** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, +1.1; NO_3^-, –1.0; F^-, –0.7; SO_4^{2-}, –1.3; Cl^-, –1.2; ClO_4^-, –0.4; Br^-, –1.0; I^-, –0.7	SSM	9.09 × 10^{-3}	9.09 × 10^{-3}	–	–	pH = 5.50; r.o.o.g.	[5]
HPO_4^{2-}-11	**HPO_4^{2-}-11** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, –1.1; NO_3^-, –1.5; F^-, –0.7; SO_4^{2-}, –2.2; Cl^-, –1.5; ClO_4^-, –1.3; Br^-, –1.4; I^-, –1.3	SSM	9.09 × 10^{-3}	9.09 × 10^{-3}	–	–	pH = 5.50; r.o.o.g.	[5]
HPO_4^{2-}-12	**HPO_4^{2-}-12** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, –0.6; NO_3^-, –0.8; F^-, –0.7; SO_4^{2-}, –1.4; Cl^-, –0.7; ClO_4^-, –0.7; Br^-, –0.6; I^-, –0.5	SSM	9.09 × 10^{-3}	9.09 × 10^{-3}	–	–	pH = 5.50; r.o.o.g.	[5]
HPO_4^{2-}13	**HPO_4^{2-}-13** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, +3.3; NO_3^-, +0.7; F^-, +1.4; SO_4^{2-}, –0.6; Cl^-, +1.1; ClO_4^-, +1.5; Br^-, +0.9; I^-, +2.3	SSM	9.09 × 10^{-3}	9.09 × 10^{-3}	–	–	pH = 5.50; r.o.o.g.	[5]
HPO_4^{2-}-14	**HPO_4^{2-}-14** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, +3.3; NO_3^-, +0.1; F^-, +3.5; SO_4^{2-}, –0.8; Cl^-, +0.2; ClO_4^-, +0.1; Br^-, +0.6; I^-, +0.8	SSM	9.09 × 10^{-3}	9.09 × 10^{-3}	–	–	pH = 5.50; r.o.o.g.	[5]
HPO_4^{2-}-15	**HPO_4^{2-}-15** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, +3.7; NO_3^-, +0.1; F^-, +2.3; SO_4^{2-}, –1.0; Cl^-, +0.6; ClO_4^-, +0.7; Br^-, +0.6; I^-, +1.0	SSM	9.09 × 10^{-3}	9.09 × 10^{-3}	–	–	pH = 5.50; r.o.o.g.	[5]
HPO_4^{2-}-16	**HPO_4^{2-}-16** (w = 2 %), oNPOE (w = 65 %), PVC (w = 33 %)	NO_3^-, –1.98; SO_4^{2-}, –4.21; Cl^-, –2.39; Br^-, –1.37; I^-, –0.05; AcO^-, –2.52	SSM	0.1	0.1	–30.1	$10^{-5.3}$–10^{-1}	20 °C; pH = 7.20 ± 0.02; $c_{dl} = 10^{-6}$ M	[6]

Table 5 (*Continued*).

ionophore	membrane composition	$\lg K_{HPO_4^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	HPO_4^{2-}-16 (w = 2 %), TODABr (x_i = 25 %), oNPOE (w = 65 %), PVC (w = 33 %)	NO_3^-, –2.38; SO_4^{2-}, –4.21; Cl^-, –3.00; Br^-, –2.14; I^-, –0.05; AcO^-, –3.19	SSM	0.1	0.1	–	–	20 °C; pH = 7.20 ± 0.02	[6]
HPO_4^{2-}-17	**HPO_4^{2-}-17** (w = 2 %), DOS (w = 30 %), PVC (w = 68 %)	CO_3^{2-}, –2.24; SCN^-, –0.68; NO_3^-, –1.82; F^-, –1.64; SO_4^{2-}, –2.89; Cl^-, –0.85; ClO_4^-, –0.64; Br^-, –1.35; I^-, –1.60; AcO^-, –2.30; $C_4H_4O_6^{2-}$, -2.85	MSM	–	–	–45	10^{-5}–10^{-1}	pH = 6.5; CWE	[7]
	HPO_4^{2-}-17 (w = 2 %), DOS (w = 30 %), PVC (w = 68 %)	SCN^-, –0.66; NO_3^-, –2.05; F^-, –2.28; SO_4^{2-}, –2.25; Cl^-, –1.24; ClO_4^-, –1.10; Br^-, –1.85; I^-, –1.30; AcO^-, –2.82	MSM	–	10^{-2}	–45	10^{-5}–10^{-1}	pH = 6.5; CW/FET	[8]
HPO_4^{2-}-18	**HPO_4^{2-}-18** (w = 20 %), DBS (w = 35 %), PVC (w = 45 %)	SCN^-, –2.30; NO_3^-, –2.77; SO_4^{2-}, –3.00; Cl^-, –2.35; AcO^-, –3.22; lactate, –3.00	modified SSM	3×10^{-5}	–	–28.9 ± 0.4	10^{-7}–10^{-1}	22 °C; pH = 7.2	[9]
HPO_4^{2-}-19	**HPO_4^{2-}-19** (w = 2–5 %), BEHS (w = 65 %), PVC (w = 29–33 %)	SCN^-, +1.3; NO_3^-, no interference; $H_2PO_4^-$, no interference; SO_4^{2-}, no interference; Cl^-, 0; ClO_4^-, +0.4; Sal^-, +3.8	MSM	–	0.01	–	–	25 ± 1 °C; pH = 5.50	[10]
HPO_4^{2-}-20	**HPO_4^{2-}-20** (w = 2–5 %), BEHS (w = 65 %), PVC (w = 29–33 %)	SCN^-, +3.5; $H_2PO_4^-$, no interference; Cl^-, 0; ClO_4^-, +0.4	SSM	–	–	–	–	25 ± 1 °C; pH = 5.50	[10]
HPO_4^{2-}-21	**HPO_4^{2-}-21** (w = 2–5 %), BEHS (w = 65 %), PVC (w = 29–33 %)	SCN^-, no interference; NO_3^-, –1.4; $H_2PO_4^-$, +1.0; SO_4^{2-}, –2.1; Cl^-, –1.3; ClO_4^-, –1.4	SSM	–	–	–	–	25 ± 1 °C; pH = 5.50	[10]
HPO_4^{2-}-22	**HPO_4^{2-}-22** (w = 2–5 %), BEHS (w = 65 %), PVC (w = 29–33 %)	SCN^-, –0.7; NO_3^-, –1.8; $H_2PO_4^-$, +1.0; SO_4^{2-}, –2.4; Cl^-, –1.8; ClO_4^-, –2.2	SSM	–	–	–	–	25 ± 1 °C; pH = 5.50	[10]

(*continues on next page*)

Table 5 (*Continued*).

ionophore	membrane composition	$lgK_{HPO_4^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
HPO_4^{2-}-23	**HPO_4^{2-}-23** (w = 2–5 %), BEHS (w = 65 %), PVC (w = 29–33 %)	SCN^-, –3.2; NO_3^-, –4.7; $H_2PO_4^-$, +1.0; SO_4^{2-}, –3.5; Cl^-, –5.2; ClO_4^-, –5.2	SSM	–	–	–	–	25 ± 1 °C; pH = 5.50	[10]
HPO_4^{2-}-24	**HPO_4^{2-}24** (w = 2–5 %), TOABr (x_i = 20 %), oNPOE (w = 66 %), PVC (w = 33 %)	NO_3^-, –1.3; SO_4^{2-}, –2.3; Cl^-, –1.8; Br^-, –1.7	FIM	–	0.1	–56	–	pH = 4.5; $c_{dl} = 10^{-3.2}$ M; CHEMFET	[11]
HPO_4^{2-}-25	**HPO_4^{2-}-25** (w = 2–5 %), TOABr (x_i = 20 %), oNPOE (w = 66 %), PVC (w = 33 %)	NO_3^-, –0.7; SO_4^{2-}, –3.3; Cl^-, –2.3; Br^-, –2.0	FIM	–	0.1 0.01 (NO_3^-)	–45	–	pH = 4.5; $c_{dl} = 10^{-3.9}$ M; CHEMFET	[11]
HPO_4^{2-}-26	**HPO_4^{2-}-26** (w = 2–5 %), TOABr (x_i = 20 %), oNPOE (w = 66 %), PVC (w = 33 %)	NO_3^-, –0.2; SO_4^{2-}, –2.3; Cl^-, –1.6; Br^-, –1.2	FIM	–	0.1 0.01 (NO_3^-)	–56	–	pH = 4.5; $c_{dl} = 10^{-3.1}$ M; CHEMFET	[11]

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(2) S.A. Glazier, M.A. Arnold, *Anal. Chem.*, **60**, 2540-2542 (1988).
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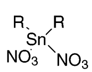
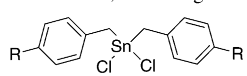
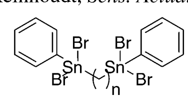


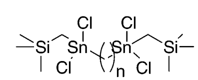
HPO_4^{2-}-1 (M_r = 469.16): R = C_8H_{17}
HPO_4^{2-}-2 (M_r = 581.37): R = $C_{12}H_{25}$



HPO_4^{2-}-3 (M_r = 440.77): R = Cl
HPO_4^{2-}-4 (M_r = 399.93): R = CH_3
HPO_4^{2-}-5 M_r = 371.88): R = H
HPO_4^{2-}-6 (M_r = 407.86): R = F

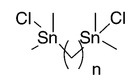


HPO_4^{2-}-7 (M_r = 725.27): n =1
HPO_4^{2-}-8 (M_r = 739.30): n =2

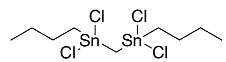


HPO_4^{2-}-9 (M_r = 595.74): n = 3
HPO_4^{2-}-10 (M_r = 609.77): n = 4

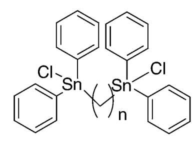
Table 5 (*Continued*).



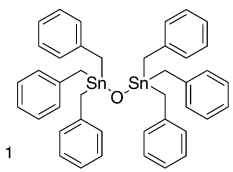
HPO_4^{2-}-11 (M_r = 382.49): n = 1
HPO_4^{2-}-12 (M_r = 410.54): n = 3



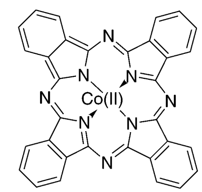
HPO_4^{2-}-13 (M_r = 507.49)



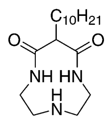
HPO_4^{2-}-14 (M_r = 630.77): n = 1
HPO_4^{2-}-15 (M_r = 644.79): n = 3



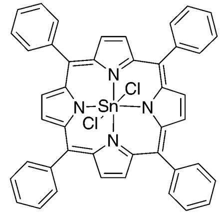
HPO_4^{2-}-16 (M_r = 800.20)



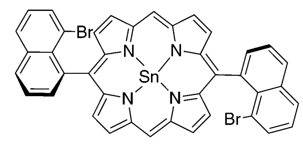
HPO_4^{2-}-17 (M_r = 825.27)



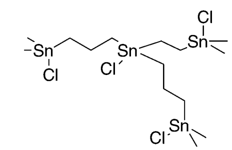
HPO_4^{2-}-18 (M_r = 242.43)



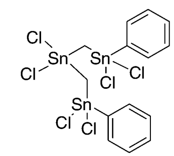
HPO_4^{2-}-19 (M_r = 802.34)



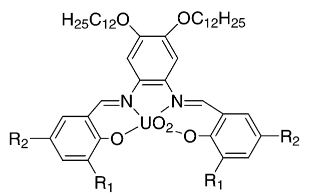
HPO_4^{2-}-20 (M_r = 837.15)



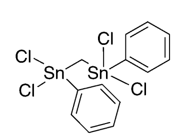
HPO_4^{2-}-21 (M_r = 819.07)



HPO_4^{2-}-22 (M_r = 751.11)



HPO_4^{2-}-24 (M_r = 953.00 : $R^1 = R^2$ = H
HPO_4^{2-}-25 (M_r = 1013.05): R^1 = OMe, R^2 = H
HPO_4^{2-}-26 (M_r = 1013.05): R^1 = H, R^2 = OMe

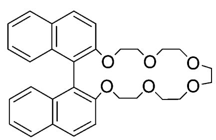


HPO_4^{2-}-23 (M_r = 547.47)

Table 6 HS^--selective electrodes.

ionophore	membrane composition	$\lg K_{HS^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
HS^--1	**HS^--1***	$B_4O_7^-$, –4.6; SCN^-, –4.9; HCO_3^-, –4.4; NO_2^-, –4.1; NO_3^-, –4.1; F^-, –5.0; HPO_4^{2-}, +1.7; $H_2PO_4^-$, +0.1; SO_4^{2-}, –6.0; $S_2O_3^-$, –3.6; Cl^-, –4.5; ClO_4^-, –6.4; Br^- –3.7; I^-, –3.5; AcO^- –4.0	FIM	–	5.0×10^{-3}	–110	2.0×10^{-7} –2.0×10^{-5}	22 °C; pH = 7.5; $c_{dl} = 6.0 \times 10^{-8}$ M; t_{95} = 2 min; Pt CWE; *electropolymerized on Pt	[1]

(1) Y.L. Ma, A. Galal, H. Zimmer, H.B. Mark, Jr., Z.F. Huang, P.L. Bishop, *Anal. Chim. Acta*, **289**, 21–26 (1994).

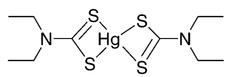


HS^--1 (M_r = 488.59)

Table 7 HSO_3^--selective electrodes.

ionophore	membrane composition	$\lg K_{HSO_3^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
HSO_3^--1	**HSO_3^--1** (w = 1.0 %), o-NPOE (w = 66 %), PVC (w = 33 %)	SCN^-, –3; NO_2^-, –3; NO_3^-, –3; PO_4^{3-}, –3; SO_4^{2-}, –3; Cl^-, –3; ClO_4^-, –2.2; I^-, –3; AcO^-, –3; Benz $^-$, –3; Sal^-, –2.3	FIM	–	5.0×10^{-3}	–47 ± 2	5.0×10^{-5} –5.0×10^{-1}	23 °C; pH = 6.0; $c_{dl} = 3.9 \times 10^{-5}$ M	[1]

(1) R.S. Hurchins, P. Molina, M. Alajarin, A. Vidal, L.G. Bachas, *Anal. Chem.*, **66**, 3188–3192 (1994).



SO_3^{2-}-1 (M_r = 497.11)

Table 8 SO_4^{2-}-selective electrodes.

ionophore	membrane composition	$\lg K_{SO_4^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
SO_4^{2-}-1	**SO_4^{2-}-1**, oNPOE, EDOA·NO_3 (x_i = 6 %), PVC (weight ratio not reported)	HCO_3^-, +4.9; SCN^-, +4.8; NO_2^-, +2.5; NO_3^-, +4.2; OH^-, +11.5; $H_2PO_4^-$, + 0.1; HPO_4^{2-}, +1.7; PO_4^{3-}, +6.0; Cl^-, +0.2; Br^-, +0.8; $Benz^-$, + 7.0; Sal^-, +9.5	MSM or SSM	–	–	–87	10^{-4}–10^{-1}	2 < pH < 8; $c_{dl} = 10^{-5}$ M; r.o.o.g.	[1]
	SO_4^{2-}-1, oNPOE, EDOA·NO_3 (x_i = 10 %), PVC (weight ratio not reported)	HCO_3^-, + 5.1; SCN^-, +5.1; NO_2^-, +2.8; NO_3^-, + 4.4; OH^-, +11.8; $H_2PO_4^-$, 0.0; HPO_4^{2-}, +1.7; PO_4^{3-}, +6.2; Cl^-, +0.2; Br^-, +0.8; $Benz^-$, +7.0; Sal^-, +9.8	MSM or SSM	–	–	–87	10^{-4}–10^{-1}	2 < pH < 8; $c_{dl} = 10^{-5}$ M; r.o.o.g.	[1]
	SO_4^{2-}-1, oNPOE, EDOA·NO_3 (x_i = 17 %), PVC (weight ratio not reported)	HCO_3^-, +4.9; SCN^-, +5.7; NO_2^-, +2.9; NO_3^-, +4.8; OH^-, +10.2; $H_2PO_4^-$, –0.1; HPO_4^{2-}, +0.9; PO_4^{3-}, +5.1; Cl^-, +0.2; Br^-, +0.9; $Benz^-$, +7.0; Sal^-, +10.2	MSM or SSM	–	–	–87	10^{-4}–10^{-1}	2 < pH < 8; $c_{dl} = 10^{-5}$ M; r.o.o.g.	[1]
	SO_4^{2-}-1, oNPOE, EDOA·NO_3 (x_i = 33 %), PVC (weight ratio not reported)	HCO_3^-, +4.3; SCN^-, +7.0; NO_2^-, +3.1; NO_3^-, +5.7; OH^-, +8.3; $H_2PO_4^-$, –0.1; HPO_4^{2-}, +0.1; PO_4^{3-}, +3.9; Cl^-, +0.2; Br^-, +1.2; $Benz^-$, +7.5; Sal^-, +11.0	MSM or SSM	–	–	–87	10^{-4}–10^{-1}	2 < pH < 8; $c_{dl} = 10^{-5}$ M; r.o.o.g	[1]
	SO_4^{2-}-1, oNPOE, EDOA·NO_3 (x_i = 50 %), PVC (weight ratio not reported)	HCO_3^-, +4.4; SCN^-, +10.2; NO_2^-- 3.8; NO_3^-, +7.8; OH^-, +7.2; $H_2PO_4^-$, –0.3; HPO_4^{2-}, +0.2; PO_4^{3-}, +4.0; Cl^-, +1.0; Br^-, +2.0; $Benz^-$, +9.0; Sal^-, +13.8	MSM or SSM	–	–	–87	10^{-4}–10^{-1}	2 < pH < 8; $c_{dl} = 10^{-5}$ M; r.o.o.g.	[1]
	SO_4^{2-}-1, oNPOE, EDOA·NO_3 (x_i = 100 %), PVC (weight ratio not reported)	HCO_3^-, +4.4; SCN^-, +12.8; NO_2^-, +5.2; NO_3^-, +9.5; OH^-, +3.6; $H_2PO_4^-$, –0.9; HPO_4^{2-}, +0.3; PO_4^{3-}, +1.1; Cl^-, +2.7; Br^-, +5.0; $Benz^-$, +8.0; Sal^-, +13.7	MSM or SSM	–	–	–87	10^{-4}–10^{-1}	2 < pH < 8; $c_{dl} = 10^{-5}$ M; r.o.o.g.	[1]

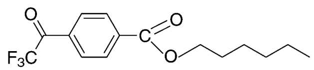
Table 8 (*Continued*).

ionophore	membrane composition	$\lg K_{SO_4^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
SO_4^{2-}-2	**SO_4^{2-}-2** (w = 1 %), TDDMACl (x_i = 50 %), oNPOE : PVC = 2 : 1 (wt/wt)	HCO_3^-, –0.9; SCN^-,+ 2.9; NO_2^-, +0.6; NO_3^-, +1.6; $H_2PO_4^-$/ HPO_4^{2-}, –1.5; HSO_3^-/SO_3^{2-}, –0.3; Cl^-, –0.1; Br^-, +1.1; AcO^-, –1.5	MPM	10^{-3} to 10^{-2}	–	–27.5 ± 0.8	$10^{-5.0}$–$10^{-2.0}$	pH = 7.0; c_{dl} = 1.5 (± 0.6) × 10^{-6} M	[2]
	SO_4^{2-}-2 (w = 1.0 %), TDDMACl (x_i = 100 %), oNPOE : PVC = 2 : 1 (wt/wt)	HCO_3^-, –0.9; SCN^-, + 2.9; NO_2^-, +0.6; NO_3^-, +1.6; $H_2PO_4^-$/ HPO_4^{2-}, –1.5 HSO_3^-/SO_3^{2-}, –0.3; Cl^-, –0.1; Br^-, +1.1; AcO^-, –1.5	MPM	10^{-3} to 10^{-2}	–	–26.7 ± 1.0	$10^{-5.0}$–$10^{-2.0}$	c_{dl} =1.6 (± 0.5) × 10^{-6} M; pH = 7.0	[2]
	SO_4^{2-}-2 (w = 1.0 %), TDDMACl (x_i = 160 %), oNPOE : PVC = 2 : 1 (wt/wt)	HCO_3^-, –0.9; SCN^-, +2.9; NO_2^-, +0.6; NO_3^-, +1.6; $H_2PO_4^-$/HPO_4^{2-}, –1.4; HSO_3^-/SO_3^{2-}, –0.3; Cl^-, +0.2; Br^-, +1.2; AcO^-, –1.4	MPM	10^{-3} to 10^{-2}	–	–24.5 ± 0.2	$10^{-5.0}$–$10^{-2.0}$	c_{dl} = 3.9 (± 0.6) × 10^{-6} M; pH = 7.0	[2]
	SO_4^{2-}-2 (w = 1.0 %), TDDMACl (x_i = 200 %), oNPOE : PVC = 2 : 1 (wt/wt)	HCO_3^-, –0.7; SCN^-, + 3.1; NO_2^-, +1.2; NO_3^-, +2.2; $H_2PO_4^-$/HPO_4^{2-}, –1.5; HSO_3^-/SO_3^{2-}, +0.4; Cl^-, +0.5; Br^-, +1.7; AcO^-, –0.5	MPM	10^{-3} to 10^{-2}	–	–25.5 ± 0.8	$10^{-3.6}$–$10^{-2.0}$	c_{dl} = 2.3 (± 0.7) × 10^{-5} M; pH = 7.0	[2]
	SO_4^{2-}-2 (w = 1.0 %), TDDMACl (x_i = 400 %), oNPOE : PVC = 2 : 1 (wt/wt)	HCO_3^-, –0.7; SCN^-, +3.1; NO_2^-, +1.3; NO_3^-, +2.2; $H_2PO_4^-$/HPO_4^{2-}, –0.9; HSO_3^-/SO_3^{2-}, +0.4; Cl^-, +0.5; Br^-, +1.7; AcO^-, –0.8	MPM	10^{-3} to 10^{-2}	–	–26.6 ± 0.1	$10^{-3.6}$–$10^{-2.0}$	c_{dl} = 2.5 (± 0.01) × 10^{-5} M; pH = 7.0	[2]

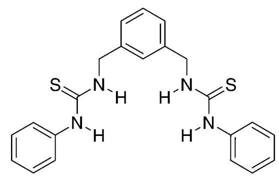
(*continues on next page*)

Table 8 (*Continued*).

(1) A.L. Smirnova, V.N. Tarasevitch, E.M.Rakhman'ko, *Sens. Actuators*, *B*, **18–19**, 392–395 (1994).
(2) S. Nishizawa, P. Bühlmann, K.P. Xiao, Y. Umezawa, *Anal. Chim. Acta*, **358**, 35–44 (1998).



SO_4^{2-}-1 (M_r = 316.36)



SO_4^{2-}-2 (M_r = 406.56)

Table 9 Cl^--selective electrodes.

ionophore	membrane composition	$\lg K_{Cl^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
Cl^--1	**Cl^--1** (5.0×10^{-3} M) chloroform	NO_3^-, –0.7; ClO_4^-, +1	SSM (bi-ionic potential)	0.1	10^{-3} (NO_3^-) 5.0×10^{-3} (ClO_4^-)	–56	10^{-4}–10^{-1}		[1]
	Cl^--1 (5.0×10^{-3} M) nitrobenzene	NO_3^-, 0.0; OH^-, 0.0; ClO_4^-, +2.7	SSM (bi-ionic potential)	0.1	10^{-3} (NO_3^-) 10^{-2} (OH^-) 5.0×10^{-3} (ClO_4^-)	–70	$10^{-3.5}$–10^{-1}		[1]
Cl^--2	**Cl^--2** (5.0×10^{-3} M) chloroform	ClO_4^-, +0.8	SSM (bi-ionic potential)	0.1	5.0×10^{-3}	–59	10^{-4}–10^{-1}		[1]
	Cl^--2 (5.0×10^{-3} M) nitrobenzene	NO_3^-, +1.4; ClO_4^-, +3.1	SSM (bi-ionic potential)	0.1	10^{-3} (NO_3^-) 5.0×10^{-3} (ClO_4^-)	–47	10^{-3}–10^{-1}		[1]
Cl^-–3	**Cl^-–3** (5.0×10^{-3} M) chloroform	NO_3^-, –0.15 OH^-, >+2.3; ClO_4^-, +0.9	SSM (bi-ionic potential)	0.1	10^{-3} (NO_3^-) 10^{-2} (OH^-) 5.0×10^{3} (ClO_4^-)	–55	10^{-3}–10^{-2}		[1]
Cl^-–4	**Cl^-–4** (5.0×10^{-3} M) chloroform	NO_3^-, –0.4; OH^-, +4.3; ClO_4^-, +1.2	SSM (bi-ionic potential)	0.1	10^{-3} (NO_3^-) 10^{-2} (OH^-); 5.0×10^{-3} (ClO_4^-)	–48	10^{-3}–10^{-1}		[1]
	Cl^-–4 (5.0×10^{-3} M) nitrobenzene	NO_3^-, –1.0; OH^-, +0.5; ClO_4^-, +2.7	SSM (bi-ionic potential)	0.1	10^{-3} (NO_3^-) 10^{-2} (OH^-) 5.0×10^{-3} (ClO_4^-)	–34	$10^{-3.5}$–10^{-1}		[1]
Cl^-–5	**Cl^-–5** (5.0×10^{-3} M) chloroform	NO_3^-, –1.0; ClO_4^-, +0.75	SSM (bi-ionic potential)	0.1	10^{-3} (NO_3^-) 5.0×10^{-3} (ClO_4^-)	–58	10^{-3}–10^{-1}		[1]
	Cl^-–5 (5.0×10^{-3} M) nitrobenzene	NO_3^-, +0.8; OH^-, +0.5; ClO_4^-, +3.6	SSM (bi-ionic potential)	0.1	10^{-3} (NO_3^-) 10^{-2} (OH^-) 5.0×10^{-3} (ClO_4^-)	–45	10^{-2}–10^{-1}		[1]
Cl^-–6	**Cl^-–6** (5.0×10^{-3} M) chloroform	NO_3^-, –0.5; OH^-, +3.4; ClO_4^-, +1.3	SSM (bi-ionic potential)	0.1	10^{-3} (NO_3^-) 10^{-2} (OH^-) 5.0×10^{-3} (ClO_4^-)	–48	10^{-3}–10^{-1}		[1]
	Cl^-–6 (5.0×10^{-3} M) nitrobenzene	NO_3^-, 0.0; OH^-, +2.95; ClO_4^-, +2.8	SSM (bi-ionic potential)	0.1	10^{-3} (NO_3^-) 10^{-2} (OH^-); 5.0×10^{-3} (ClO_4^-)	–34	$10^{-3.5}$–10^{-1}		[1]

(*continues on next page*)

Table 9 (*Continued*).

ionophore	membrane composition	$\lg K_{Cl^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
Cl⁻-7	**Cl⁻-7** (w = 1.0 %), ETH 469 (w = 66 %), PVC (w = 33 %)	SCN^-, +3.4; HCO_3^-, +1.0; N_3^-, +3.4; NO_2^-, +3.1; NO_3^-, +0.05; F^-, +0.05; HPO_4^{2-}, –0.3; SO_4^{2-}, –0.5; ClO_4^-, +0.8; Br^-, +0.2; I^-, +1.1; AcO^-, –0.05	SSM	0.1	0.1	–	–	20.0 ± 0.5 °C; 7.35 < pH < 7.45	[2]
Cl⁻-8	**Cl⁻-8** (w = 1.0 %), ETH 469 (w = 66 %), PVC (w = 33 %)	SCN^-, +3.7; HCO_3^-, +0.3; N_3^-, +3.7; NO_2^- +2.6; NO_3^-, +0.5; F^-, –0.15; HPO_4^{2-}, –0.4; SO_4^{2-}, –0.05; ClO_4^-, +2.0; Br^-, +0.4; I^-, +3.6; AcO^-, –0.1	SSM	0.1	0.1	–	–	20.0 ± 0.5 °C; 7.35 < pH < 7.45	[2]
Cl⁻-9	**Cl⁻-9** (w = 1.0 %), ETH 469 (w = 66 %), PVC (w = 33 %)	SCN^-, +3.4; HCO_3^-, –1.8; N_3^-, +2.8; NO_2^-, +0.5; NO_3^-, –0.2; F^-, –1.0; HPO_4^{2-}, –2.7; SO_4^{2-}, –4.0; ClO_4^-, +1.3; Br^-, +0.4; I^-, +1.0; AcO^-, –1.85	SSM	0.1	0.1	–42.1	$10^{-3.6}$–$10^{-1.0}$	20.0 ± 0.5 °C; 7.35 < pH < 7.45	[2]
Cl⁻-10	**Cl⁻-10** (w = 1 %), BBPA (w = 66 %), PVC (w = 33 %)	SCN^-, +3.4; HCO_3^-, +0.3; NO_2^-, +3.1; NO_3^-, +0.1; HPO_4^{2-}, –0.4; SO_4^{2-}, –0.2; ClO_4^-, +0.6; Br^-, +0.2; I^-, +0.7; AcO^-, +0.1	SSM	0.1	0.1	–	–	20–21 °C; pH = 7.5	[3]
Cl⁻-11	**Cl⁻-11** (w = 1 %), BBPA (w = 66 %), PVC (w = 33 %)	SCN^-, +0.1; HCO_3^-, –4.3; NO_3^-, –3.8; HPO_4^{2-}, –8.3; SO_4^{2-}, –5.2; ClO_4^-, –1.5; Br^-, +0.2; I^-, +0.7; AcO^-, –0.5	SSM	0.1	0.1	–58.4	10^{-4}–10^{-1}	20–21 °C; pH = 7.5	[3]
	Cl⁻-11 (w = 20.0 %), BBPA (w = 52.8 %), PVC (w = 27.2 %)	SCN^-, +2.7; HCO_3^-, +0.8; NO_3^-, –0.5; HPO_4^{2-}, –2.2; SO_4^{2-}, –1.6; ClO_4^-, +0.2; Br^-, +0.2; I^-, +0.9; AcO^-, –0.3	SSM	0.1	0.1	–	–	20–21 °C; pH = 7.5	[3]
Cl⁻-12	**Cl⁻-12** (w = 1.5 %), BBPA (w = 65.7 %), PVC (w = 32.8 %)	SCN^-, +1.5; HCO_3^-, +1.2; NO_3^-, –3.1; HPO_4^{2-}, –4.3; SO_4^{2-}, –5.2; ClO_4^-, –0.2; Br^-, +0.3; I^-, +1.0; AcO^-, +1.4	SSM	0.1	0.1	–	–	20–21 °C; pH = 7.5	[3]

Table 9 (*Continued*).

ionophore	membrane composition	$\lg K_{Cl^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
	Cl⁻-12 (w = 13.3 %), ETH 500 (w = 6.7 %), TPP (w = 13.3 %) stearyl alcohol (w = 66.7 %)	SCN^-, +3.0; NO_3^-, 0.0; SO_4^{2-}, –2.1; ClO_4^-, +1.2; Br^-, +0.4; I^-, >+5; AcO^-, –0.9; $Benz^-$, +0.5; pTS^{-*}, +0.3	SSM	0.01	0.01	–61.0 ± 3.2	10^{-4}–10^{-1}	25 ± 0.5 °C; *pTS, p-toluene sulfonate	[4]
	Cl⁻-12 (w = 20 %), DMSNE (w = 40 %), PVC (w = 40 %)	SCN^-,+3.6; HCO_3^-, +0.4; NO_3^-, 0.0; HPO_4^{2-}, –1.5; SO_4^{2-}, –1.8; ClO_4^-, +1.0; Br^-, +0.4; I^-, +1.2; AcO^-, –0.7	SSM	–	–	–	–	19 ± 1 °C; pH = 6; r.o.o.g.	[5]
	Cl⁻-12 (w = 1.5 %), BBPA (w = 65.5 %), PVC (w = 33 %)	SCN^-, +1.4; NO_3^-, –2.1; F^-, –0.4; ClO_4^-, –1.4; Br^-, +0.4; I^-, +2.0; AcO^-, –0.1; Sal^-, +2.6;	SSM	0.1	0.1	–57.3	$10^{-3.5}$–$10^{-1.0}$	25 ± 0.5 °C; Ag CWE; FIA; r.o.o.g.	[6]
Cl⁻-13	**Cl⁻-13** (w = 1.7 %), BBPA (w = 66.1 %), PVC (w = 37.2 %)	HCO_3^-, +0.5; SCN^-, +0.2; NO_3^-, –0.4; HPO_4^{2-}, –1.0; SO_4^{2-}, –1.0; ClO_4^-, +0.2; Br^-, 0.0; I^-, –0.2; AcO^-, 0.0	SSM	0.1	0.1	–	–	20–21 °C	[3]
Cl⁻-14	**Cl⁻-14** (w = 5 %), 1-decanol (w = 4 %), ETH 500 (x_i = 15 %) oNPOE (w = 90 %)	SCN^-, +3.40 ± 0.07; HCO_3^-, –1.50 ± 0.09; NO_2^-, +0.74 ± 0.01; NO_3^-, +1.15 ± 0.03; F^-, –1.77 ± 0.18; HPO_4^{2-},–2.93 ± 0.08; ClO_4^-, +3.55 ± 0.03; SO_4^{2-}, –2.60 ± 0.08; Br^-, +0.91 ± 0.01; I^-, +2.41 ± 0.01; AcO^-, -1.25 ± 0.08; lactate, –0.96 ± 0.12; malate, –1.85 ± 0.03; oxalate, –2.38 ± 0.04; citrate, –2.57 ± 0.04; isothianate, –1.28 ± 0.19; Sal^-, +2.97 ± 0.09	SSM	0.1	0.1	–57.5 ± 0.5	–	pH = 7.4; single barreled microelectrode	[7]

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Table 9 (*Continued*).

ionophore	membrane composition	$\lg K_{Cl^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
	Cl⁻-14 (w = 5 %), 1-decanol (w = 4 %), ETH 500 (x_i = 15 %) oNPOE (w = 90 %)	SCN^-, +3.54 ± 0.08; $HCOO^-$, +0.99 ± 0.08; HCO_3^-, –1.40 ± 0.03; SO_4^{2-}, –2.56 ± 0.12; AcO^-, –1.35 ± 0.07; gluconate, –2.39 ± 0.15	SSM	0.1	0.1	–52.4 ± 0.5	–	pH = 7.4; double barreled microelectrode	[7]
	Cl⁻14 (w = 5 %), 1-decanol (w = 4 %), ETH 500 (x_i = 15 %) oNPOE (w = 90 %)	NO_2^-, +0.6; NO_3^-, –1.2; ClO_4^-, +1.8; Br^-, +0.4; I^-, +1.6; SO_4^{2-}, –7.3; AcO^-, –4.6	SSM	0.1	0.1			microelectrode	[8]
	Cl⁻-14 (w = 0.9 %), oNPOE (w = 12.3 %), silicon rubber (w = 86.8 %)	Sal^-, +2.8	SSM ($E_A = E_B$)	–	–	–62.6	–	$c_{dl} = 10^{-3.1}$ M	[9]
	Cl⁻-14 (w = 0.9 %), DBS (w = 12.3 %), silicon rubber (w = 86.8 %)	Sal^-, +3.0	SSM ($E_A = E_B$)	–	–	–18.0	–	$c_{dl} = 10^{-2.9}$ M	[9]
Cl⁻-15	**Cl⁻-15** (w = 3 %), oNPOE (w = 55 %), PVC (w = 42 %)	HCO_3^-, –1.7; SCN^-, +4.0 NO_3^-, +2.5; F^-, –2.7; SO_4^{2-}, –2.4; ClO_4^-, +5.3; Br^-, +2.5; I^-, +3.5; AcO^-, –1.8	MSM	–	–	–55	10^{-6}–10^{-1}	19 ± 1 °C conditioned in 10^{-3} M $CuCl_2$ for 24 h; 3.7 < pH < 9.0; c_{dl} = 1.3 × 10^{-5} M; r.o.o.g.	[5]
Cl⁻-16	**Cl⁻-16** (w = 3 %), oNPOE (w = 55 %), PVC (w = 42 %)	HCO_3^-, –1.6; SCN^-, +4.2; NO_3^-, +2.6; $H_2PO_4^-$, –2.3; F^-, –2.7; SO_4^{2-}, –2.3; ClO_4^-, +5.3, Br^-, +1.5; AcO^-, –1.6	MSM	–	–	–55	10^{-5}–10^{-1}	19 ± 1 °C; conditioned in 10^{-3} M $CuCl_2$ for 24 h; 3.7 < pH < 9.0; c_{dl} = 1.3 × 10^{-5} M; r.o.o.g.	[5]
Cl⁻-17	**Cl⁻17** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +0.9; HCO_3^-, –2.2; ClO_4^-, –0.2; Br^-, + 0.3; I^-, +1.6; AcO^-, –1.4; Sal^-, +1.6;	SSM	0.01	0.01	–80 to –85	10^{-3}–5×10^{-1}	22 °C; 4.5 < pH < 9.0; pH = 7.2	[10]
	Cl⁻-17, asymmetric cellulose triacetate, (weight ratio not reported)	SCN^-, +1.5; HCO_3^-, –0.8; ClO_4^-, +2.1; Br^-, + 0.4; I^-, +1.4; AcO^-, –0.6; Sal^-, +0.3; citrate, <–2.2; lactate, < –2.2; ascorbate, < –2.2	SSM ($E_A = E_B$)	–	0.01	–	–	22 °C; FIA; pH= 7.2 (0.05 M phosphate buffer, containing 1.4% (wt/wt) dialysed BSA as	[10]

Table 9 (*Continued*).

ionophore	membrane composition	$\lg K_{Cl^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
		SCN^-, +1.1; HCO_3^-, –1.0; ClO_4^-, +1.7; Br^-, <–1.0; I^-, +1.0; AcO^-, <–1.3; Sal^-, <–1.3; citrate, <–1.3; lactate, < –1.3; ascorbate, < –1.3	SSM ($E_A = E_B$)	–	0.001	–	–	diluent stream)	
		SCN^-, +1.9; HCO_3^-, –2.2; ClO_4^-, +2.3; Br^-, + 0.5; I^-, +1.6; AcO^-, –0.5; Sal^-, +1.8; citrate, <–2.2; lactate, < –2.2; ascorbate, < –2.2	SSM ($E_A = E_B$)	–	0.01	–	–	22 °C; FIA; pH= 7.2 (0.05 M phosphate buffer as diluent stream)	
		SCN^-, +1.2; HCO_3^-, –0.9; ClO_4^-, +2.0; Br^-, <–1.0; I^-, +1.0; AcO^-, –0.1; Sal^-, –0.7; citrate, <–1.2; lactate, < –1.2	SSM ($E_A = E_B$)	–	0.001	–	–		
	Cl⁻-17 (w = 0.6-1 %), KTFPB (x_i = 30 %), oNPOE : PVC = 2 : 1 (wt/wt)	SCN^-, +1.4; NO_2^-,+ 0.3; NO_3^-, –3.8; ClO_4^-, –2.6; I^-, +0.9; Sal^-, +2.2	SSM	0.01	0.01	–	–	22 ± 2 °C	[11]
	Cl⁻-17 (w = 0.6-1 %), KTFPB (x_i = 19 %), oNPOE : PVC = 2 : 1 (wt/wt)	SCN^-, +1.3; NO_2^-, +0.8; NO_3^-, –4.1; ClO_4^-, –2.5; I^-, +0.7; Sal^-, +2.7	SSM	0.01	0.01	–	–	22 ± 2 °C	[11]
	Cl⁻-17 (w = 0.6-1 %), KTFPB (x_i = 9 %), oNPOE : PVC = 2 : 1 (wt/wt)	SCN^-, +1.2; NO_2^-,+ 0.7; NO_3^-, –3.8; ClO_4^-, –1.9; I^-, +0.7; Sal^-, +2.7	SSM	0.01	0.01	–	–	22 ± 2 °C	[11]
	Cl⁻-17 (w = 0.6-1 %), oNPOE : PVC = 2 : 1 (wt/wt)	SCN^-, +1.5; NO_2^-, +0.7; NO_3^-, –3.2; ClO_4^-, –0.7; I^-, +1.2; Sal^-, +1.9	SSM	0.01	0.01	–	–	22 ± 2 °C	[11]
	Cl⁻-17 (w = 0.6-1 %), TDDMACl (x_i = 11 %), oNPOE : PVC = 2 : 1 (wt/wt)	SCN^-, +3.6; NO_2^-, +0.6; NO_3^-, +1.0; ClO_4^-, +4.5; I^-, +3.6; Sal^-, +2.5	SSM	0.01	0.01	–	–	22 ± 2 °C	[11]
	Cl⁻-17 (w = 0.6-1 %), TDDMACl (x_i = 21 %), oNPOE : PVC = 2 : 1 (wt/wt)	SCN^-, +3.9; NO_2^-, +0.9; NO_3^-, +1.4; ClO_4^-, +4.8; I^-, +3.3; Sal^-, +2.7	SSM	0.01	0.01	–	–	22 ± 2 °C	[11]
	Cl⁻-17 (w = 0.6-1 %), oNPOE (w = 66 %), PVC (w = 33 %) TDDMACl (x_i = 20 %)	SCN^-, +3.2; NO_2^-, +0.6; NO_3^-, +1.0; F^-, –0.9; ClO_4^-, +3.6; Br^-, +1.0; I^-, +3.2; Sal^-, +2.8	SSM	0.01	0.01	–	–	22 ± 2 °C; τ > 30 d	[12]

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Table 9 (*Continued*).

ionophore	membrane composition	$\lg K_{Cl^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
	Cl⁻-17 (w = 0.6-1 %), oNPOE (w = 66 %), PVC (w = 33 %) TDDMACl (x_i = 5 %)	SCN^-, +2.8; NO_2^-, +0.6; NO_3^-, 0.0; F^-, –0.9; ClO_4^-, +2.5; Br^-, +0.9; I^-, +2.7; Sal^-, +2.6	SSM	0.01	0.01	–	–	22 ± 2 °C; pH = 5.5	[12]
	Cl⁻-17 (w = 0.6-1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.4; NO_2^-, +0.7; NO_3^-, –3.6; F^-, –2.1; ClO_4^-, –1.2; Br^-, +1.4; I^-, +0.7; Sal^-, +1.9	SSM	0.01	0.01	–	–	22 ± 2 °C; pH = 5.5	[12]
	Cl⁻-17 (w = 0.6-1 %), oNPOE (w = 66 %), PVC (w = 33 %) NaTFPB (x_i = 9 %)	SCN^-, +2.1; NO_2^-, +1.6; NO_3^-, –4.2; F^-, –.4; ClO_4^-, –.8; Br^-, +1.2; I^-, +1.4; Sal^-, +2.6	SSM	0.01	0.01	–	–	22 ± 2 °C; pH = 5.5	[12]
	Cl⁻-17 (w = 0.6-1 %), oNPOE (w = 66 %), PVC (w = 33 %) NaTFPB (x_i = 19 %)	SCN^-, +1.7; NO_2^-, +1.2; NO_3^-, –4.4; F^-, –3.4; ClO_4^-, –2.2; Br^-, –1.1; I^-, +1.1; Sal^-, +2.4	SSM	0.01	0.01	–	–	22 ± 2 °C; pH = 5.5	[12]
	Cl⁻-17 (w = 0.6-1 %), oNPOE (w = 66 %), PVC (w = 33 %) NaTFPB (x_i = 32 %)	SCN^-, +1.2; NO_2^-, +0.6; NO_3^-, – 4.8; F^-, –3.0; ClO_4^-, –2.6; Br^-, +0.2; I^-, +0.7; Sal^-, +2.2	SSM	0.01	0.01	–	–	22 ± 2 °C; pH = 5.5	[12]
	Cl⁻-17 (w = 0.9 %), oNPOE (w = 12.3 %), silicon rubber (w = 86.8 %)	Sal^-, +1.6	SSM ($E_A = E_B$)	–	–	–84.0		$c_{dl} = 10^{-3.6}$ M	[9]
	Cl⁻-17 (w = 0.9 %), DBS (w = 12.3 %), silicon rubber (w = 86.8 %)	SCN^-, +0.9; NO_3^-, <–5.0; Br^-, +0.50; ClO_4^-, <–5.0; Sal^-, +1.1	SSM ($E_A = E_B$)	–	–	–53.7		$c_{dl} = 10^{-4.0}$ M; pH = 5.5	[9]
Cl⁻-18	**Cl⁻-18** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.1; HCO_3^-, –2.1; ClO_4^-, –0.4; Br^-, +0.3; I^-, +1.7; AcO^-, –1.4; Sal^-, +1.5	SSM	0.01	0.01	–	–	22°C; pH = 7.2	[10]
Cl⁻-19	**Cl⁻-19** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +0.9; HCO_3^-, –2.4; ClO_4^-, +0.1; Br^-, +0.4; I^-, +1.6; AcO^-, –1.4; Sal^-, +1.6	SSM	0.01	0.01	–	–	22°C; pH = 7.2	[10]

Table 9 (*Continued*).

ionophore	membrane composition	$\lg K_{Cl^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
Cl⁻-20	**Cl⁻-20** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-,+ 0.8; HCO_3^-, –1.7; ClO_4^-, –0.1; Br^-, +0.6; I^-, +1.1; AcO^-, –0.8; Sal^-, +1.9;	SSM	0.01	0.01	–	–	22°C; pH = 7.2	[10]
Cl⁻-21	**Cl⁻-21** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.1; HCO_3^-, –1.7; ClO_4^-, –0.1; I^-, +1.0, Br^-, +0.6; AcO^-, –1.0; Sal^-, +2.0	SSM	0.01	0.01	–	–	22°C; pH = 7.2	[10]
Cl⁻-22	**Cl⁻-22** (w = 2.0 %), BEHS (w = 65.0 %), PVC (w = 33.0 %)	SCN^-, –0.4; HCO_3^-, –6.7; NO_3^-, –5.3; F^-, –5.9 HPO_4^{2-}, –6.6; SO_4^{2-}, –7.5; ClO_4^-, –3.7; Br^-, –1.0; I^-, –1.5; AcO^-, –5.6; Sal^-, +0.2	SSM	0.1	0.1	–	10^{-5}–10^{-3}	22 ± 1 °C; t_{90} = 81 s; pH = 7.4 ± 0.1; r.o.o.g.	[13]
	Cl⁻-22 (w = 2.0 %), TDDMACl (x_i = 2.5 %), BEHS (w = 65.0 %), PVC (w = 33.0 %)	SCN^-, –0.2; HCO_3^-, –5.5; NO_3^-, –3.0; F^-, –5.5; HPO_4^{2-}, –5.9; SO_4^{2-}, –6.3; ClO_4^-, –1.7; Br^-, +0.0; I^-, +1.0; AcO^-, –5.1; Sal^-, –0.5	SSM	0.1	0.1	–58.6	10^{-5}–10^{-1}	22 ± 1 °C; t_{90} = 9.5 s; c_{dl} = 10^{-5} M; pH = 7.4 ± 0.1; r.o.o.g.	[13]
	Cl⁻-22 (w = 2.0 %), TDDMACl (x_i = 1 %), BEHS (w = 65.0 %), PVC (w = 33.0 %)	SCN^-, –0.2; HCO_3^-, –5.5; NO_3^-, –3.0; F^-, –5.4; HPO_4^{2-}, –5.9; SO_4^{2-}, –6.3; ClO_4^-, –1.7; Br^-, +0.0; I^-, +1.1; AcO^-, –5.1; Sal^-, –0.4	SSM	0.1	0.1	–	–	22 °C	[14]
Cl⁻-23	**Cl⁻-23** (w = 2.0 %), BEHS (w = 65.0 %), PVC (w = 33 %)	SCN^-, –1.0; HCO_3^- –4.8; NO_3^-, –4.8; F^-, –4.5; HPO_4^{2-}, –3.8; SO_4^{2-}, –5.0 ClO_4^-, –3.5; Br^-, –1.4; I^-, –1.2; AcO^-, –4.3; Sal^-, –0.4	SSM	0.1	0.1	–	–	22°C; pH = 7.4 ± 0.1; r.o.o.g.	[13]
	Cl⁻-23 (w = 2.0 %), TDDMACl (x_i = 2.5 %), BEHS (w = 65.0 %), PVC (w = 33.0 %)	SCN^-, +0.1; HCO_3^-, –3.0; NO_3^-, –3.0; F^-, –3.7; HPO_4^-, –3.6; SO_4^{2-}, –4.0; ClO_4^-, –2.0; Br^-, +0.1; I^-, +1.0; AcO^-, –3.3; Sal^-, –0.4	SSM	0.1	0.1	–	–	22 ± 1 °C; c_{dl} = 10^{-5} M; pH = 7.4 ± 0.1; r.o.o.g.	[13]

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Table 9 (*Continued*).

ionophore	membrane composition	$\lg K_{Cl^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
Cl⁻-24	**Cl⁻-24** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, –0.1; HCO_3^-, –5.9; NO_3^-, –5.8; F^-, –5.9; HPO_4^{2-}, –6.2; SO_4^{2-}, –7.4; ClO_4^-, –3.6; Br^-, –0.7; I^-, –0.5; AcO^-, –5.8; Sal^-, –0.1	SSM	0.01	0.01	–57.2 ± 1.1	10^{-5} to 10^{-1}	22 °C	[14]
	Cl⁻-24 (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %) TDDMACl (x_i = 1 %)	SCN^-, –0.4; HCO_3^-,–4.9; NO_3^-, –3.5; HPO_4^{2-}, –5.1; F^-, –4.7; SO_4^{2-}, –5.8; ClO_4^-, –1.3; Br^-, –0.4; I^-, +0.1; AcO^-, –4.7; Sal^-, –0.6	SSM	0.01	0.01	–	–	22 °C	[14]
Cl⁻-25	**Cl⁻-25** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, +0.4; HCO_3^-, –6.2; NO_3^-, –5.1; HPO_4^{2-}, –6.2; F^-, –5.6; SO_4^{2-}, –7.2; ClO_4^-, –3.6; Br^-, –0.2; I^-, –0.6; AcO^-, –5.6; Sal^-, 0.0	SSM	0.01	0.01	–	–	~22 °C	[14]
Cl⁻-26	**Cl⁻-26** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, –0.3; HCO_3^-,–4.8; NO_3^-, –6.7; HPO_4^{2-}, –6.9; F^-, –6.3; SO_4^{2-}, –6.4; ClO_4^-, –4.5; Br^-, –1.4; I^-, –1.7; AcO^-, –6.3; Sal^-, 0.0	SSM	0.01	0.01	–	–	22 °C	[14]
	Cl⁻-26 (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %), TDDMACl (x_i = 1 %)	SCN^-, –0.3; HCO_3^-,–4.8; NO_3^-, –6.7; HPO_4^{2-}, –6.9; F^-, –6.3; SO_4^{2-}, –6.4; ClO_4^-, –4.5; Br^-, –1.4; I^-, –1.7; AcO^-, –6.3; Sal^-, 0.0	SSM	0.01	0.01	–56.9 ± 1.3	10^{-5}–10^{-1}	22 °C; t_{90} = 15.8 ± 1.5 s	[14]
Cl⁻-27	**Cl⁻-27** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, –0.0; HCO_3^-,–3.6; NO_3^-, –5.8; HPO_4^{2-}, –5.0; F^-, –4.6; SO_4^{2-}, –5.1; ClO_4^-, –4.0; Br^-, –0.0; I^-, +0.1; AcO^-, –4.4; Sal^-, –0.2	SSM	0.01	0.01	–	–	22 °C	[14]

Table 9 (*Continued*).

ionophore	membrane composition	$\lg K_{Cl^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	Cl⁻-27 (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %), TDDMACl (x_i = 1 %)	SCN^-, –1.2; HCO_3^-,–2.8; NO_3^-, –2.2; HPO_4^{2-}, –3.4; F^-, –3.2; SO_4^{2-}, –3.6; ClO_4^-, –0.2; Br^-, +1.0; I^-, +2.3; AcO^-, –3.1; Sal^-, +0.8	SSM	0.01	0.01	–47.3 ± 3.9	10^{-5}–10^{-1}	22 °C	[14]
Cl⁻-28	**Cl⁻-28** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %), TDDMACl (x_i = 1 %)	SCN^-, +0.1; HCO_3^-,–1.4; NO_3^-, –2.9; HPO_4^{2-}, –2.7; F^-, –2.6; SO_4^{2-}, –1.7; ClO_4^-, –2.1; Br^-, +0.1; I^-, +0.1; AcO^-, –1.6; Sal^-, –0.2	SSM	0.01	0.01	< –20	–	22 °C	[14] .
Cl⁻-29	**Cl⁻-29** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, 0.0; HCO_3^-,–0.2; NO_3^-, –1.0; HPO_4^{2-}, –1.3; F^-, –1.0; SO_4^{2-}, –1.7; ClO_4^-, –0.6; Br^-, +0.1; I^-, +0.1; AcO^-, –0.8; Sal^-, 0.1	SSM	0.01	0.01	–	–	22 °C	[14]
Cl⁻-30	**Cl⁻-30** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %)	SCN^-, +0.1; HCO_3^-,–4.5; NO_3^-, –4.2; HPO_4^{2-}, –3.8; F^-, –4.3; SO_4^{2-}, –5.3; ClO_4^-, –3.5; Br^-, +0.1; I^-, +0.1; AcO^-, –4.0; Sal^-, 0.6	SSM	0.01	0.01	–45.3 ± 8.8	10^{-5}–10^{-1}	22 °C	[14] .
	Cl⁻-30 (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %), TDDMACl (x_i = 1 %)	SCN^-, +0.1; HCO_3^-,–2.5; NO_3^-, 0.0; HPO_4^{2-}, –2.6; F^-, –; SO_4^{2-}, –3.4; ClO_4^-, +1.4; Br^-, 0.0; I^-, +0.3; AcO^-, –1.2; Sal^-, –1.7	SSM	0.01	0.01	–56.6 ± 1.9	10^{-5}–10^{-1}	22 °C	[14]
Cl⁻-31	**Cl⁻-31** (w = 2 %), BEHS (w = 65 %), PVC (w = 33 %), TDDMACl (x_i = 1 %)	SCN^-, +1.1; HCO_3^-,–; NO_3^-, –1.1; HPO_4^{2-}, –3.0; F^-, –2.8; SO_4^{2-}, –2.9; ClO_4^-, +1.4; Br^-, +0.7; I^-, +2.2; AcO^-, –2.6; Sal^-, +0.3	SSM	0.01	0.01	< –20	–	22 °C; t_{90} = 15.8 ± 1.5 s	[14]

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Table 9 (*Continued*).

ionophore	membrane composition	$\lg K_{Cl^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
Cl⁻-32	**Cl⁻-32** (w = 1 %), TDDMACl (x_i = 50 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +1.0; HCO_3^-, –2.6; NO_3^-, + 0.2; HPO_4^{2-}, <–3.5; $H_2PO_4^-$, <–3.5; SO_3^{2-}, –2.0; HSO_3^-, –2.0; SO_4^{2-}, –1.2 Br^-, +0.2; I^-, –0.2; AcO^-, –2.3; Sal^-, +0.7;	MPM	$10^{-5.00}$ to $10^{-4.70}$		–54 ± 1.0	$10^{-5.0}$–10^{-2}	23 ± 1 °C; c_{dl} = (6.5 ± 3) × 10^{-6} M; pH = 7.0	[15]
		SCN^-, +1.6; NO_3^-, +0.7; Br^-, +0.4; I^-, +0.5; Sal^-, +1.8	MPM	$10^{-2.34}$ to $10^{-2.04}$					
	Cl⁻-32 (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %), TDDMACl (x_i = 35 %)	HCO_3^-, no interference; SCN^-, +1.8; Br^-, +0.6	MPM	$10^{-2.34}$ to $10^{-2.04}$	–	–50.8 ± 1.2	10^{-4}–10^{-2}	23 °C; pH = 7.0; c_{dl} = 1.3 × 10^{-5} M	[15]
	Cl⁻-32 (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %), TDDMACl (x_i = 100 %)	HCO_3^-, no interference; SCN^-, > +2.6; Br^-, +0.8	MPM	$10^{-2.34}$ to $10^{-2.04}$	–	–55.0 ± 1.0	10^{-5}–10^{-2}	23 °C; pH = 7.0; c_{dl} = 7.7 × 10^{-6} M	[15]
	Cl⁻-32 (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %), TDDMACl (x_i = 150 %)	HCO_3^-, no interference; SCN^-, > +2.6; Br^-, +1.0	MPM	$10^{-2.34}$ to $10^{-2.04}$	–	–58.8 ± 2.1	10^{-4}–10^{-2}	23 °C pH = 7.0; c_{dl} = 6.3 × 10^{-5} M	[15]
Cl⁻-33	**Cl⁻-33** (w = 1 %), oNPOE (w = 66 %), TDDMACl (x_i = 22 %), PVC (w = 33 %)	SCN^-, +3.3; HCO_3^-, –0.4; NO_2^-, +0.5; NO_3^-, +1.8; F^-, –0.4; ClO_4^-, +4.2; Br^-, +0.9; I^-, +1.8; Sal^-, +3.2	SSM	0.01	0.01	–	–	~22 °C; pH = 5.5; r.o.o.g.	[12]
	Cl⁻-33 (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %), TDDMACl (x_i = 10 %)	SCN^-, +2.2; HCO_3^-, –0.2; NO_2^-, +0.2; NO_3^-, +0.6; F^- –1.0; ClO_4^-, +2.7; Br^-, +0.4; I^-, +1.8; Sal^-, +1.8	SSM	0.01	0.01	–15	$10^{-5.0}$–$10^{-1.6}$	~22 °C; τ > 30 d; pH = 5.5; r.o.o.g.	[12]
	Cl⁻-33 (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +2.3; HCO_3^-, –0.05; NO_2^-,+ 0.1; NO_3^-, +0.3; F^-, –1.0; ClO_4^-, +2.7; Br^-, +0.4; I^-, +2.4; Sal^-, +0.7	SSM	0.01	0.01	–25	–	~22 °C; τ > 30 d; pH = 5.5; r.o.o.g.	[12]

Table 9 (*Continued*).

ionophore	membrane composition	$\lg K_{Cl^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	Cl⁻-33 (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %), NaTFPB (x_i = 14 %)	SCN^-, +0.15; HCO_3^-, –0.8; NO_2^-, +0.2; NO_3^-, –2.9; F^-, –2.85; ClO_4^-, –2.6; Br^-, +0.5; I^-, +0.3; Sal^-, +0.15	SSM	0.01	0.01	–57	$10^{-5.0}$–$10^{-1.6}$	~22 °C; τ > 30 d; pH = 5.5; r.o.o.g.	[12]
	Cl⁻-33 (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %), NaTFPB (x_i = 20 %)	SCN^-, +0.5; HCO_3^-, –0.3; NO_2^-, +0.5; NO_3^-, –2.8; F^-, –2.4; ClO_4^-, –2.8; Br^-, +0.3; I^-, +0.8; Sal^-, +0.5	SSM	0.01	0.01	–	–	~22 °C; τ > 30 d; pH = 5.5; r.o.o.g.	[12]
	Cl⁻-33 (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %), NaTFPB (x_i = 30 %)	SCN^-, +0.5; HCO_3^-, –0.1; NO_2^-, +0.5; NO_3^-, –2.75; F^-, –2.6; ClO_4^-, –2.75; Br^-, +0.3; I^-, +0.7; Sal^-, +0.5	SSM	0.01	0.01	–54	$10^{-5.0}$–$10^{-1.6}$	~22 °C; τ > 30 d; pH = 5.5; r.o.o.g.	[12]
Cl⁻-34	**Cl⁻-34** (w = 0.9 %), oNPOE (w = 12.3 %), silicon rubber (w = 86.8 %)	Sal^-, +2.5	SSM ($E_A = E_B$)	–	–	–	–	$c_{dl} = 10^{-3.5}$ M	[9]
	Cl⁻-34 (w = 0.9 %), DBS (w = 12.3 %), silicon rubber (w = 86.8 %)	Sal^-, +2.8	SSM ($E_A = E_B$)	–	–	–70.8	–	$c_{dl} = 10^{-2.8}$ M	[9]

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(*continues on next page*)

Table 9 (*Continued*).

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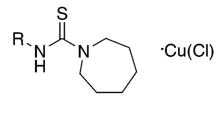
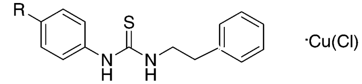
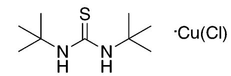
(14) M. Rothmaier, U. Schaller, W.E. Morf, E. Pretsch, *Anal. Chim. Acta*, **327**, 17-28 (1996).
(15) K.P. Xiao, P. Bühlmann, S. Nishizawa, S. Amemiya, Y. Umezawa, *Anal. Chem.*, **69**, 1038-1044 (1997).



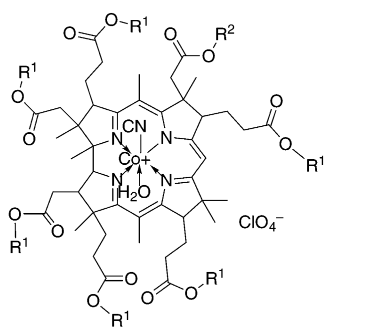
Cl⁻-1 (M_r = 242.43): R = isohexyl
Cl⁻-2 (M_r = 234.36): R = phenyl
Cl⁻-3 (M_r = 262.41): R = ethylphenyl



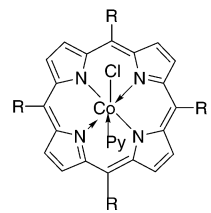
Cl⁻-4 (M_r = 286.39): R = methoxy
Cl⁻-6 (M_r = 256.37): R = H



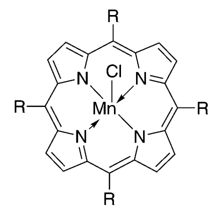
Cl⁻-5 (M_r = 188.33)



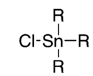
Cl⁻-7 (M_r = 1793.44): $R^1 = R^2 = CH_2CH_2C_6H_5$
Cl⁻-10 (M_r =1401.02): $R^1 = CH_3$; $R^2 = C_{18}H_{37}$



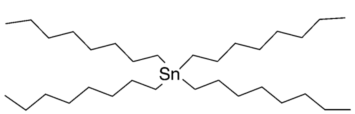
Cl⁻-8 (M_r = 1294.89):
R =$C_6H_5CO_2C_6H_{11}$



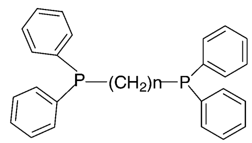
Cl⁻-9 (M_r = 1211. 79): M = Mn(III), R = $C_6H_5CO_2C_6H_{11}$
Cl⁻-14 (M_r = 703.13): M = Mn(III), R = C_6H_5,
Cl⁻-18 (M_r = 763.01): M = In(III), R = C_6H_5
Cl⁻-33 (M_r = 836.44): M = Tl(III), R = C_6H_5



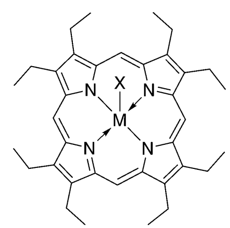
Cl⁻-11 (M_r = 325.49): R = butyl
Cl⁻-12 (M_r = 493.82): R = octyl



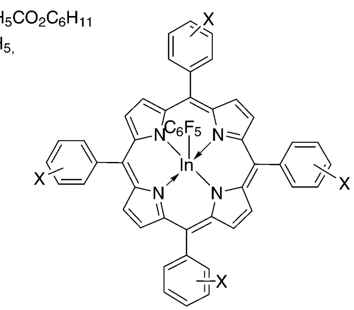
Cl⁻-13 (M_r = 571.59)



Cl⁻-15 (M_r = 398.43): n = 2
Cl⁻-16 (M_r = 412.46): n = 3

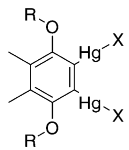


Cl⁻-17 (M_r = 683.05): M = In(III), X = Cl
Cl⁻-34 (M_r = 623.17): M = Mn(III), X = Cl

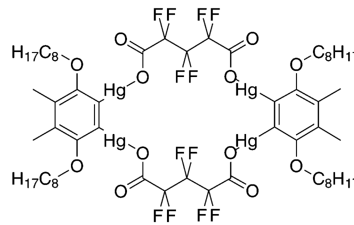


Cl⁻-19 (M_r = 894.62): X = H
Cl⁻-20 (M_r = 938.63): X = *p*-methyl
Cl⁻-21 (M_r = 938.63): X = *m*-methyl

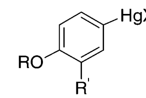
Table 9 (*Continued*).



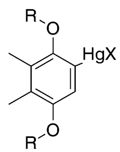
Cl^--22 (ETH 9009, M_r = 987.80): X = $OCOCF_3$, R = octyl
Cl^--24 (ETH 9018, M_r = 1100.0): X = $OCOCF_3$, R =dodecyl.
Cl^--25 (ETH 9032, M_r = 992.1): X = $OCOCH_3$, R = dodecyl.
Cl^--26 (ETH 9033, M_r = 944.9): X = Cl, R = dodecyl
Cl^--27 (ETH 5640, M_r = 1033.8): X = Br, R = dodecyl



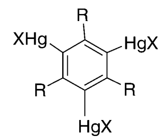
Cl^--23 (ETH 9011, obtained as 1:4 DMSO adduct, M_r = 1999.61)



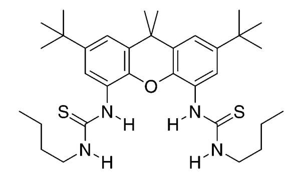
Cl^--28 (ETH 9030, M_r = 497.5): X = Cl, R = dodecyl, R' = H
Cl^--30 (ETH 9039, M_r = 816.7): X=Cl, R=octadecyl, R' = HgCl



Cl^--29 (ETH 9031, M_r = 733.4): X=$OCOCH_3$, R=dodecyl



Cl^--31 (ETH 9041, M_r = 1100.1): X = $OCOCF_3$, R = ethyl



Cl^--32 (M_r = 582.91)

Table 10 ClO_4^--selective electrodes.

ionophore	membrane composition	$\lg K_{ClO_4^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
ClO_4^--1	**ClO_4^--1** (w = 2.5 %), DBP (w = 67.5 %), PVC (w = 30 %)	$B_4O_7^{2-}$, –3.64; CO_3^{2-}, –3.38; HCO_3^-, –3.57; SCN^-, –0.19; NO_3^-, –3.37; F^-, –2.96; HPO_4^{2-}, –2.49; $H_2PO_4^-$, –2.21; $H_2PO_2^-$, –2.82; SO_3^{2-}, –3.62; SO_4^{2-}, –3.36; (Na)Cl^-, –3.48; (K)Cl^-, –3.27; (Ba)Cl^-, –3.45; Br^-, –3.35; I^-, –2.89; IO_3^-, –2.14; AcO^-, –4.10; $C_4H_4O_6^{2-}$, –3.45	SSM	–	–	–58	4.0×10^{-6} -1.0×10^{-1}	25 ± 1 °C; CWE; t_{resp} (>10^{-3} M), 40 s; t_{resp} (<10^{-4} M), 90 s; τ > 60 d; 3 < pH < 10	[1]
		$B_4O_7^{2-}$, –4.01; CO_3^{2-}, –3.60; HCO_3^-, –3.66; SCN^-, –0.49; NO_3^-, –3.37; F^-, –2.96; HPO_4^{2-}, –2.49; $H_2PO_4^-$, –2.21; $H_2PO_2^-$, –2.92; SO_3^{2-}, –3.35; SO_4^{2-}, –3.37; (Na)Cl^-, –3.45; (K)Cl^-, –3.37; (Ba)Cl^-, –3.43; Br^-, –3.38; I^-, –2.74; IO_3^-, –2.10; AcO^-, –4.14; $C_4H_4O_6^{2-}$, –4.27	MSM	–	–				
ClO_4^--2	**ClO_4^--2** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	HCO_3^-, –3.4; SCN^-, –0.4; NO_2^-, –1.8; NO_3^-, –2.3; F^-, –4.4; HPO_4^{2-}, –3.8; SO_3^{2-}, –3.2; SO_4^{2-}, –3.8; Cl^-, –2.6; Br^-, –1.2; I^-, +0.2; Sal^-, –0.8; AcO^-, –3.1; $Benz^-$, –2.2	SSM (pH = 7)	0.1	0.1	–	–	internal electrolyte, 0.001 M $HgCl_2$; pH = 4; r.o.o.g.	[2]
		HCO_3^-, –5.3; SCN^-, –1.0; NO_2^-, –2.6; NO_3^-, –3.1; F^-, –5.4; HPO_4^{2-}, –5.6; SO_3^{2-}, –4.9; SO_4^{2-}, –5.7; Cl^-, –4.0; Br^-, –1.8; I^-, +0.5; AcO^-, –5.3; $Benz^-$, –3.3; Sal^-, –1.4	SSM (pH = 7)	0.1	0.1	–56.5*	10^{-5}–10^{-1}* $10^{-3.5}$–10^{-1}**	internal electrolyte, 0.01 M $HgCl_2$; pH = 4; 3 < pH < 11; t_{resp} < 30 s; τ > 6 weeks; *, in 0.1 M Na_2SO_4; **, in 0.1 M Cl^- or NO_3^-; r.o.o.g.	
		NO_3^-, –3.1; SO_4^{2-}, –5.1; Cl^-, –3.4; Br^-, –2.2; Sal^-, –2.1	FIM (pH = 7)	–	0.1				

Table 10 (*Continued*).

ionophore	membrane composition	$\lg K_{ClO_4^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
		HCO_3^-, –5.3; SCN^-, –0.2; NO_2^-, –1.5; F^-, –5.2; HPO_4^{2-}, –5.5; SO_3^{2-}, –5.1; SO_4^{2-}, –5.2; Cl^-, –3.0; Br^-, –1.0; I^-, +1.5; AcO^-, –5.2; $Benz^-$, –2.6; Sal^-, –1.6	SSM (pH = 7)	0.1	0.1	–	–	internal electrolyte, 0.1 M $HgCl_2$, pH = 3; r.o.o.g.	
ClO_4^--3	**ClO_4^--3** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	HCO_3^-, –4.3; SCN^-, –1.0; NO_2^-, –2.7; NO_2^-, –3.0; F^-, –4.3; HPO_4^{2-}, –4.5; SO_3^{2-}, –4.5; SO_4^{2-}, –4.9; Cl^-, –3.8; Br^-, –1.8; I^-, +3.0; AcO^-, –4.3; $Benz^-$, –4.4; Sal^-, –1.5	SSM (pH = 7)	0.1	0.1	–	–	internal electrolyte, 0.01 M $HgCl_2$, pH = 4; r.o.o.g	[2]
ClO_4^--4	**ClO_4^--4** (w = 4.7 %), oNPOE (w = 64 %), PVC (w = 31.3 %)	BF_4^-, –2.0; CO_3^{2-}, –4.5; HCO_3^-, –4.4; SCN^-, –1.0; NO_2^-, –3.9; NO_3^-, –3.4; HPO_4^{2-}, –5.0; HSO_3^-, –5.2; SO_4^{2-}, –4.6; Cl^-, –4.9; Br^-, –4.5; I^-, –2.9	FIM	–	–	+54	6×10^{-7} – 1×10^{-2}	CHEMFETs; 25 ± 0.1 °C; $c_{dl} = 3 \times 10^{-7}$ M; 1 < pH < 11; t_{resp} < 4 s; τ > 60 d; r.o.o.g.	[3,4]
	ClO_4^--4 (w = 4.7 %), oNPOE (w = 64 %), PVC (w = 31.3 %)	BF_4^-, –1.2; CO_3^-, –4.9; CO_3^{2-}, –4.3; SCN^-, –1.2; NO_2^-, –4.2; NO_3^-, –2.8; HPO_4^{2-}, –5.3; HSO_3^-, –4.8; SO_4^{2-}, –5.0; Cl^-, –5.2; Br^-, –4.2; I^-, –1.8	FIM	–	–	–56	1×10^{-6} – 1×10^{-2}	25 ± 0.1 °C; $c_{dl} = 8 \times 10^{-7}$ M; t_{resp} < 10 s; 1.5 < pH < 13.5; τ > 270 d; r.o.o.g.	[3,4]

(1) J. Liu, Y. Masuda, E. Sekido, *Analyst,* **115**, 1089-1092 (1990).

(2) W. Wróblewski, E. Malinowska, Z. Brzozka, *Electroanalysis*, **8**, 75-78 (1996).

(3) J. Casabo, L. Escriche, C. Pérez-Jiménez, J.A. Muñoz, F. Teixidor, J. Bausells, A. Errachid, *Anal. Chim. Acta*, **320**, 63-68 (1996).

(4) A. Errachid, C. Pérez-Jiménez, J. Casabó, L. Escrische, J.A. Muñoz, A. Bratov, J. Bausells, *Sens. Actuators, B*, **43**, 206-210 (1997).

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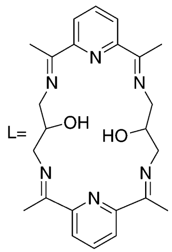
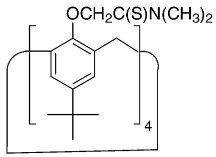
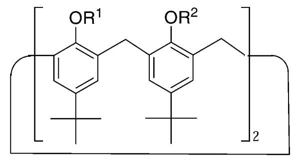
Table 10 (*Continued*).



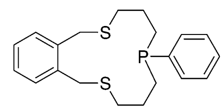
ClO_4^--1: $Ba(L)(ClO_4)_2$ (M_r = 770.77)



ClO_4^--2 (M_r =1053.60)



ClO_4^--3 (M_r = 935.43): R^1 = $CH_2CH_2CH_3$, R^2 = $OCH_2C(S)N(CH_3)_2$

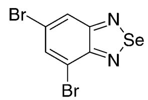


ClO_4^--4 (M_r = 360.51)

Table 11 SeO_3^{2-}-selective electrodes.

ionophore	membrane composition	$\log K_{SeO_3^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
SeO_3^{2-}-1	**SeO_3^{2-}-1** (w = 2 %), DBP (w = 71 %), PVC (w = 27 %)	NO_3^-, –5.25; HPO_4^{2-}, –5.29; SO_4^{2-}, –5.33; Cl^-, –5.25; ClO_4^-, –4.96; I^-, –5.00; AsO_2^-, –3.11; MoO_4^{2-}, –5.39; TeO_3^{2-}, –2.64; $C_6H_5CO_2^-$, –5.21; $C_6H_4(CO_2^-)_2$, –5.12	SSM	0.001	0.001	–23.6	3.2×10^{-6} –1.0×10^{-1}	21 °C; $c_{dl} = 1.0 \times 10^{-6}$ M; pH = 10	[1]

(1) Q. Cai, Y. Ji, W. Shi, Y. Li, *Talanta*, **39**, 1269-1272 (1992).



SeO_3^{2-}-1 (M_r = 340.86)

Table 12 I^--selective electrodes.

ionophore	membrane composition	$\lg K_{I^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
I⁻-1	**I⁻-1** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, –2.0; ClO_4^-, –2.0; Br^-, –1.8; I^-, –3.7; Sal^-, –0.8	FIM	–	7.45×10^{-3}	–55 to –59	10^{-6}–10^{-4}	pH = 5.5; $c_{dl} = 4.2 \times 10^{-7}$ M; $t_{resp} < 1$ min; $\tau < 30$ d; r.o.o.g.; K was obtained as K_{X^-,AcO^-}.	[1]
I⁻-2	**I⁻-2** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, –2.1; ClO_4^-, –1.8; I^-, –4.2; Sal^-, –1.8;	FIM	–	7.45×10^{-3}	–53 to –60	10^{-6}–10^{-4}	pH = 5.5; $c_{dl} = 9.1 \times 10^{-7}$ M; $t_{resp} < 1$ min; $\tau < 7$ d; r.o.o.g.; K was obtained as K_{X^-,AcO^-}.	[1]
I⁻-3	**I⁻-3** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, –2.0; NO_3^-, –1.5; ClO_4^-, –2.8; Br^-, –0.8; I^-, –1.7; Sal^-, –1.5	FIM	–	7.45×10^{-3}	–	–	r.o.o.g.; K was obtained as K_{X^-,AcO^-}.	[1]
I⁻-4	**I⁻-4** (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, –2.5; NO_3^-, –1.0; ClO_4^-, –4.0; Br^- –0.8; I^-, –1.5; Sal^-, –2.2	FIM	–	7.45×10^{-3}	–	–	r.o.o.g.; K was obtained as K_{X^-,AcO^-}.	[1]
I⁻-5	**I⁻-5** (w = 0.5 %), BEHS (w = 66 %), PVC (w = 33.5 %)	Cl^-, –5.3; Br^-, –2.5	MPM	–	–	nN		$t_{resp} < 30$ s; $c_{dl} = 3.0 \times 10^{-8}$ M	[2]
I⁻-6	**I⁻-6** (w = 2.5 %), oNPOE (w = 66.5 %), PVC (w = 31 %)	SCN^-, –2.2; NO_2^-, –2.2; NO_3^-, –4.2; SO_4^{2-}, –4.5; Cl^-, –4.3; ClO_4^-, –2.4; Br^-, –2.5	SSM	–	–	–56.2 ± 2	10^{-6}–10^{-1}	$t_{90} < 1$ min; $c_{dl} = 7 \times 10^{-7}$ M; $\tau > 60$ d; 20 °C	[3]
I⁻-7	**I⁻-7** (w = 2.5 %), oNPOE (w = 66.5 %), PVC (w = 31 %)	SCN^-, –2.1; NO_2^-, –2.1; NO_3^-, –4.2; SO_4^{2-}, –4.4; Cl^-, –4.1; ClO_4^-, –2.4; Br^-, –2.6	SSM	–	–	–55.8 ± 0.8	6×10^{-6}–2×10^{-2}	$t_{90} < 1$ min; $c_{dl} = 7 \times 10^{-7}$ M; $\tau > 60$ d; pH = 2.5; 20 °C	[3]
I⁻-8	**I⁻-8** (w = 0.2 %), 1,1,2,2-tetrachloroethane	SCN^-, –2.27; NO_3^-, –15.71; F^-, –13.12; Cl^-, –5.76; ClO_4^-, –10.55 Br^-, –3.50	MSM or SSM	–	–57	–		25 ± 0.1 °C	[4]
I⁻-9	**I⁻-9** (w = 2 %), BEHS (w = 66 %), PVC (w = 32 %)	SCN^-, –2.1 ± 0.2; HCO_3^-, –4.2 ± 0.2; CO_3^-, –4.3 ± 0.2; NO_2^-, –4.0 ± 0.2;	MPM	–	0.1	–58.7	6×10^{-6}–2×10^{-2}	$t_{resp} < 10$ s; $c_{dl} = 7.5 \times 10^{-7}$ M; $\tau > 35$ d; pH = 6.5	[5]

Table 12 (*Continued*).

ionophore	membrane composition	$\lg K_{I^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
		NO_3^-, –4.1 ± 0.2; Cl^-, –4.0 ± 0.2; ClO_4^-, –2.4 ± 0.2; Br^-, –2.1 ± 0.1;							
I⁻-10	**I⁻-10** (w = 1.5 %), oNPOE (w = 66 %), PVC (w = 32.5 %)	SCN^-, –2.76; NO_2^-, –3.02; NO_3^-, –3.87; SO_4^{2-}, –4.95; Cl^-, –4.06; ClO_4^-, –2.30; Br^-, –3.48; AcO^-, –4.00	SSM	0.01	0.01	–54.7 ± 0.2	8.0×10^{-6} -10^{-1}	pH = 3.0; c_{dl} = 5.0 (± 0.3) $\times 10^{-6}$ M	[6]
	I⁻-10 (w = 1.5 %), DDP (w = 66 %), PVC (w = 32.5 %)	SCN^-, –1.75; NO_2^-, –2.91; NO_3^-, –3.58; SO_4^{2-}, –4.55; Cl^-, –3.56; ClO_4^-, –2.95; Br^-, –3.10; AcO^-, –3.41	SSM	0.01	0.01	–49.4 ± 0.6	10^{-5} -10^{-2}	pH = 3.0; c_{dl} = 7.6 (± 0.5) $\times 10^{-6}$ M	[6]
	I⁻-10 (w =1.5 %), DDS (w = 66 %), PVC (w = 32.5 %)	SCN^-, –1.78; NO_2^-, –2.78; NO_3^-, –3.58; SO_4^{2-}, –4.81; Cl^-, –3.74; ClO_4^-, –2.46; Br^-, –3.25; AcO^-, –3.62	SSM	0.01	0.01	–42.8 ± 0.5	10^{-5} -10^{-2}	pH = 3.0; c_{dl} = 8.8 (± 0.5) $\times 10^{-6}$ M	[6]
I⁻-11	**I⁻-11**, o-nitrobenzenyl octyl ether (?), PVC (weight ratio not reported)	NO_2^-, –0.57 SCN^-, –1.67; NO_3^-, –2.20; SO_4^{2-}, –2.99; Cl^-, –2.46; ClO_4^-, –0.85; Br^-, –1.60	SSM FIM	0.01 –	0.01 0.1	–57.8	6×10^{-6} -2×10^{-2}	pH = 2.0; $c_{dl} = 6.4 \times 10^{-7}$ M; t_{90} < 1 s; 20 °C	[7]
I⁻-12	**I⁻-12** (w = 2.5 %), oNPOE (w = 64.5 %), PVC (w = 33 %)	SCN^-, –1.9; NO_2^-, –2.5; NO_3^-, –2.5; SO_4^{2-}, –4.5; Cl^-, –2.4; ClO_4^-, –2.3; Br^-, –1.9	SSM	0.01	0.01	–58 ± 0.2	5×10^{-7} -5×10^{-4}	pH = 9.15; $c_{dl} = 3.5 \times 10^{-7}$ M; t_{resp} < 5 s; 20 °C; pH = 2.0	[8]
I⁻-13	**I⁻-13** (multifilms on 2-aminoethanethiol modified Ag)	SCN^-, –3.7; NO_2^-, –4.0; NO_3^-, –5.0; SO_3^{2-}, –4.5; SO_4^{2-}, –5.5; Cl^-, –4.9; ClO_4^-, –3.7; Br^-, –3.9	FIM	–	0.1	–59*	1.6×10^{-6} –0.1*	AgCWE; t_{90*} = 15 s; c_{dl}* = 10^{-6} M; *, in acetate buffer at pH = 4.6	[9]

(1) V.J. Wotring, D.M. Johnson, L.G. Bachas, *Anal. Chem.*, **62**, 1506-1510 (1990).

(2) J. Bricker, S. Daunert, L.G. Bachas, *Anal. Chem.*, **63**, 1585-1589 (1991).

(3) R. Yuan, Y.-Q. Chai, D. Liu, D. Gao, J.-Z. Li, R.-Q. Yu, *Anal. Chem.*, **65**, 2572-2575 (1993).

(4) W. Szczepaniak, M. Ren, *Electroanalysis*, **6**, 341-347 (1994).

(5) F.Z. El Aamrani, A. Sastre, M. Aguilar, L. Beyer, A. Florido, *Anal. Chim. Acta*, **329**, 247-252 (1996).

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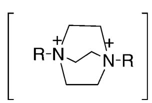
Table 12 (*Continued*).

(6) M. Ying, R. Yuan, X.-M. Zhang, Y.-Q. Song, Z.-Q. Li, G.-L. Shen, R.-Q. Yu, *Analyst*, **122**, 1143-1146 (1997).

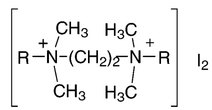
(7) Z.-Q. Li, R. Yuan, M. Ying, Y.-Q. Song, G.-L. Shen, R.-Q. Yu, *Anal. Lett.*, **30**, 1455-1464 (1997).

(8) Y.-Q. Song, R. Yuan, M. Ying, Z.-Q. Li, Y.-Q. Chai, H. Cui, G.-L. Shen, R.-Q. Yu, *Fresenius' J. Anal. Chem.*, **360**, 47-51 (1998).

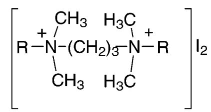
(9) C. Sun, J. Zhao, H. Xu, Y. Sun, X. Zhang, J. Shen, *Talanta*, **46**, 15-21 (1998).



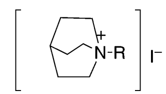
I⁻-1 (M_r = 872.98)



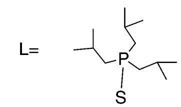
I⁻-2 (M_r = 877.01)



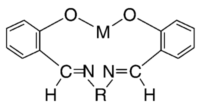
I⁻-3 (M_r = 891.03)



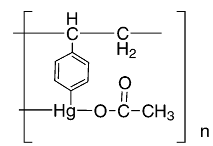
I⁻-4 (M_r = 519.64)



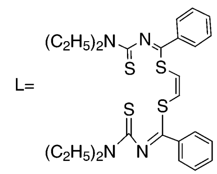
I⁻-5 $AgNO_3 \cdot 2L$ or $(AgNO_3)_2 \cdot 3L$



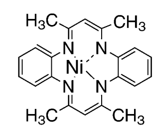
I⁻-6 (M_r = 325.24): M = Co(II), R = C_2H_4
I⁻-7 (M_r = 373.28): M = Co(II), R = C_6H_4



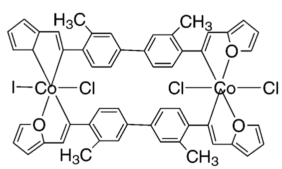
I⁻-8



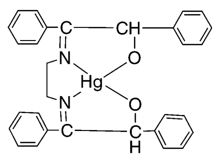
I⁻-9, AgL (M_r = 459.44)



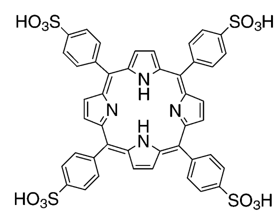
I⁻-10 (M_r = 379.14)



I⁻-11 (M_r = 988.57)



I⁻-12 (M_r = 641.14)

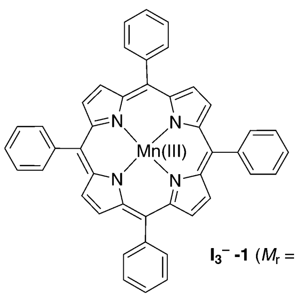


I⁻-13 (M_r = 932.97)

Table 13 I_3^--selective electrodes.

ionophore	membrane composition	$\lg K_{I_3^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linea range (M)	remarks	ref.
I_3^--1	**I_3^--1** (w = 5 %), FNDPE (w = 68 %), PVC (w = 27 %)	HCO_3^-, <–4.0; NO_3^-, <–4.0; F^-, <–4.0; Cl^-, <–4.0; ClO_4^-, <–4.0; Br^-, <–4.0; I^-, <–4.0; Benz–, –3.4; propionate, <–4.0; Sal^-, –3.3	FIM	–	0.1	–87.2 ±0.7	10^{-5} –10^{-3}	t_{resp} < 30 s; $c_{dl} = 3.0 \times 10^{-8}$ M; 2 < pH < 9	[1]

(1) H. Suzuki, H. Nakagawa, M. Mifune, Y. Saito, *Anal. Sci.*, **9**, 351-354 (1993).

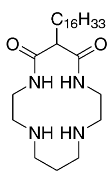


I_3^--1 (M_r = 667.68)

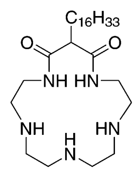
Table 14 $[Ni(CN)_4]^{2-}$-selective electrodes.

ionophore	membrane composition	$\lg K_{[Ni(CN)_4]^{2-},B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
$[Ni(CN)_4]^{2-}$-1	**$[Ni(CN)_4]^{2-}$-1***, oNPOE (w = 74.1 %), PVC (w = 25.9 %) *satn in oNPOE	$[Pt(CN)_4]^{2-}$, –0.01; $[Fe(CN)_6]^{3-}$, < –3.0; $[Fe(CN)_6]^{4-}$, < –3.0	MPM	1×10^{-4} to 2×10^{-4}	–	–25 to –30	–	20 °C; $c_{dl} = 10^{-6}$ M; pH = 4.0	[1]
$[Ni(CN)_4]^{2-}$-2	**$[Ni(CN)_4]^{2-}$-2**,*, oNPOE (w = 74.1 %), PVC (w = 25.9 %) *satn in oNPOE	$[Pt(CN)_4]^{2-}$, –0.04; $[Fe(CN)_6]^{3-}$, < –3.0; $[Fe(CN)_6]^{4-}$ < –3.0	MPM	1×10^{-4} to 2×10^{-4}	–	–25 to –30	–	20 °C; $c_{dl} = 10^{-6}$ M; pH = 4.0	[1]
$[Ni(CN)_4]^{2-}$-3	**$[Ni(CN)_4]^{2-}$-3** (w =1.5 %), oNPOE (w = 73.0 %), PVC (w = 25.5 %)	$[Fe(CN)_6]^{3-}$, –1.3; $[Fe(CN)_6]^{4-}$, –1.7	MPM	1×10^{-4} to 2×10^{-4}	–	–25 to –30	–	20 °C; $c_{dl} = 10^{-6}$ M; pH = 4.0	[1]
$[Ni(CN)_4]^{2-}$-4	**$[Ni(CN)_4]^{2-}$-4** (w =1.5 %), oNPOE (w = 73.0 %), PVC (w = 25.5 %)	$[Fe(CN)_6]^{3-}$, –0.8; $[Fe(CN)_6]^{4-}$, –1.7	MPM	1×10^{-4} to 2×10^{-4}	–	–25 to –30	–	20 °C; $c_{dl} = 10^{-6}$ M; pH = 4.0	[1]

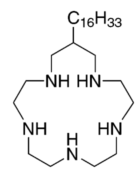
(1) R. Naganawa, H. Radecka, M. Kataoka, K. Tohda, K. Odashima, Y. Umezawa, E. Kimura, T. Koike, *Electroanalysis*, **5**, 731–738 (1993).



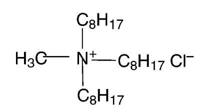
$[Ni(CN)_4]^{2-}$-1 (M_r = 452.73)



$[Ni(CN)_4]^{2-}$-2 (M_r = 481.77)



$[Ni(CN)_4]^{2-}$-3 (M_r =453.80)



$[Ni(CN)_4]^{2-}$-4 (M_r = 404.17)

Table 15 F^--selective electrodes.

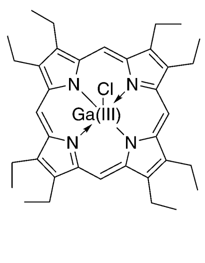
ionophore	membrane composition	$\lg K_{F^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
F⁻-1	**F⁻-1** (w = 1 %), TDDMACl (x_i = 23 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, + 3.5; NO_2^-,+ 0.8; NO_3^-, +1.6; F^-, –0.5; ClO_4^-, +4.3; Br^-, +1.0; I^-, +3.0; Sal^-, +3.1	SSM	0.01	0.01	–	–	22 °C; pH = 5.5; r.o.o.g.; K was obtained as $K_{Cl^-,B^{n-}}$.	[1]
	F⁻-1 (w = 1 %), TDDMACl (x_i = 11 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +3.2; NO_2^-, +1.0; NO_3^-, +1.1 ; F^-, –0.3; ClO_4^-, +3.8; Br^-, +0.5; I^-, +2.3; Sal^-, +3.1	SSM	0.01	0.01	–	–	22 °C; pH = 5.5; r.o.o.g.; K was obtained as $K_{Cl^-,B^{n-}}$.	[1]
	F⁻-1 (w = 1 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +4.5; NO_2^-, + 2.0; NO_3^-, +0.9; F^-, +2.8; ClO_4^-, +3.6; Br^-, +0.1; I^-, +1.5; Sal^-, +4.5	SSM	0.01	0.01	–65 to –70	–	22 °C; t_{90} = 40–50 s; pH = 5.5; r.o.o.g; K was obtained as $K_{Cl^-,B^{n-}}$.	[1]
	F⁻-1 (w = 1 %), NaTFPB (x_i = 11 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +4.5; NO_2^-, +2.0; NO_3^-, +0.5; F^-, +2.6; ClO_4^-, +3.2; Br^-, 0.0; I^-, +1.6; Sal^-, +4.6	SSM	0.01	0.01	–	–	22 °C; pH = 5.5; r.o.o.g.; K was obtained as $K_{Cl^-,B^{n-}}$.	[1]
	F⁻-1 (w = 1 %), NaTFPB (x_i = 21 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +3.8; NO_2^-, +1.8; NO_3^-, +0.3; F^-, + 2.2; ClO_4^-, +2.5; Br^-, –0.1; I^-, +1.2; Sal^-, +4.0	SSM	0.01	0.01	–70 to –80	10^{-3}–10^{-1}	22 °C; $c_{dl} = 5 \times 10^{-3}$ M (pH = 7.4); $c_{dl} = 3.2 \times 10^{-5}$ M (pH = 4.5); pH = 5.5; r.o.o.g; K was obtained as $K_{Cl^-,B^{n-}}$.	[1]
	F⁻-1 (w = 1 %), NaTFPB (x_i = 30 %), oNPOE (w = 66 %), PVC (w = 33 %)	SCN^-, +4.0; NO_2^-, +1.7; NO_3^-, + 0.3; F^-, +2.2; ClO_4^-, +2.8; Br^-, –0.1; I^-, +1.1; Sal^-, +4.0	SSM	0.01	0.01	–	–	22 °C; $c_{dl} = 5 \times 10^{-3}$ M; pH = 5.5; r.o.o.g; K was obtained as $K_{Cl^-,B^{n-}}$.	[1]
F⁻-2	**F⁻-2** (w = 1 %), TOABr (x_i = 20 %), oNPOE (w = 66 %), PVC(w = 33 %)	NO_3^-, –2.0; SO_4^{2-}, –2.5; Cl^-, –2.0; ClO_4^-, –1.7; Br^-, –2.1	FIM	–	0.1	–53	–	pH = 6.0; $c_{dl} = 3.2 \times 10^{-3}$ M; ISFET	[2]
	F⁻-2 (w = 2.0 %), TOABr (x_i = 20 %), polysiloxane with acetylphenoxy-propyl substituent (w = 98 %)	NO_3^-, –2.4; SO_4^{2-}, –2.8; Cl^-, –2.5; ClO_4^-, –2.0; Br^-, –2.4	FIM	–	0.1	–55	–	pH = 6.0; $c_{dl} = 3.4 \times 10^{-3}$ M; ISFET	[2]

(*continues on next page*)

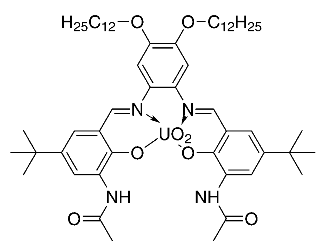
Table 15 (*Continued*).

ionophore	membrane composition	$\lg K_{F^-,B^{n-}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/decade)	linear range (M)	remarks	ref.
	F⁻-2 (w = 2.0 %), TOABr (x_i = 20 %), polysiloxane with benzoylamino-propyl substituent (w = 98 %)	NO_3^-, –2.0; SO_4^{2-}, –2.6; Cl^-, –2.2; ClO_4^-, –0.7; Br^-, –1.9	FIM	–	0.1 0.01 (ClO_4^-)	–55	–	pH = 6.0; c_{dl} = 3.1 × 10^{-3} M; ISFET	[2]
	F⁻-2 (w = 2.0 %), TOABr (x_i = 20 %), polysiloxane with phenylsulfonyl-propyl substituent (w = 98 %)	NO_3^-, –2.6; SO_4^{2-}, –3.0; Cl^-, –2.5; ClO_4^-, –2.2; Br^-, –2.5	FIM	–	0.1	–55	–	pH = 6.0; c_{dl} = 3.5 × 10^{-3} M; ISFET	[2]

(1) E.D. Steinle, U. Schaller, M.E. Meyerhoff, *Anal. Sci.*, **14,** 79-83 (1998).
(2) M.M.G. Antonisse, B.H.M. Snellink-Ruel, J.F.J. Engbersen, D.N. Reinhoudt, *J. Chem. Soc., Perkin Trans. 2*, 773-777 (1998).



F⁻-1 (M_r = 637.94)



F⁻-2 (M_r = 1153.30)