Table 11: Ba^{2+}-Selective Electrodes

ionophore	membrane composition	$\lg K_{Ba^{2+},B^{n+}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
Ba^{2+}-1	**Ba^{2+}-1** (*w* = 1.1 %), oNPOE (*w* = 65.9 %), PVC (*w* = 33.0 %)	H^+, +1.4 ; Li^+, –3.0; Na^+, –2.1; K^+, –1.0; Rb^+, –1.3; Cs^+, –1.8; NH_4^+, –1.8; Mg^{2+}, –5.2; Ca^{2+}, –3.8; Sr^{2+}, –1.6	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
Ba^{2+}-2	**Ba^{2+}-2** (*w* = 1.1 %), oNPOE (*w* = 65.9 %), PVC (*w* = 33.0 %)	H^+, +5.3 ; Li^+, –1.0; Na^+,+0.5; K^+, –1.8; Rb^+, +1.7; Cs^+, +1.6; NH_4^+, +0.6; Mg^{2+}, –2.2; Ca^{2+}, –1.3; Sr^{2+}, –0.7	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
	Ba^{2+}-2 (*w* = 1.1 %), oNPOE (*w* = 66.3 %), KTpClPB (x_i = 66 %), PVC (*w* = 32.1 %)	H^+, –2.5 ; Li^+, –3.0; Na^+,–2.5; K^+, –1.8; Rb^+, –1.6; Cs^+, –1.3; NH_4^+, –2.4; Mg^{2+}, –7.0; Ca^{2+}, –1.6; Sr^{2+}, –0.4	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
Ba^{2+}-3	**Ba^{2+}-3** (*w* = 1.4 %), oNPOE (*w* = 65.5 %), PVC (*w* = 33.1 %)	H^+, +6.5 ; Li^+, –0.6; Na^+,+2.0; K^+, +3.3 Rb^+, +3.5; Cs^+, +3.7; NH_4^+, +2.2; Mg^{2+}, –0.9; Ca^{2+}, –0.8; Sr^{2+}, –0.3	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
	Ba^{2+}-3 (*w* = 1.4 %), oNPOE (*w* = 65.1 %), KTpClPB (x_i = 75 %), PVC (*w* = 32.7 %)	H^+, –1.5 ; Li^+, –1.7; Na^+,–1.5; K^+, –0.3; Rb^+, –0.9; Cs^+, –0.4; NH_4^+, –1.3; Mg^{2+}, –4.3; Ca^{2+}, –1.9; Sr^{2+}, –1.0	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
Ba^{2+}-4	**Ba^{2+}-4** (*w* = 1.2 %), oNPOE (*w* = 65.8 %), PVC (*w* = 33.0 %)	H^+, +4.2 ; Li^+, –1.6; Na^+,–0.5; K^+, –0.7; Rb^+, –0.9; Cs^+, –1.0; NH_4^+, –1.3; Mg^{2+}, –4.3; Ca^{2+}, –1.8; Sr^{2+}, +0.2	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
	Ba^{2+}-4 (*w* = 1.2 %), oNPOE (*w* = 65.2 %), KTpClPB (x_i = 65 %), PVC (*w* = 32.9 %)	H^+, –1.7 ; Li^+, –3.3; Na^+,–2.7; K^+, –2.7; Rb^+, –2.9; Cs^+, –2.9; NH_4^+, –3.3; Mg^{2+}, –7.8; Ca^{2+}, –1.8; Sr^{2+}, –0.2	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
Ba^{2+}-5	**Ba^{2+}-5** (*w* = 1.2 %), oNPOE (*w* = 65.9 %), PVC (*w* = 33.2 %)	H^+, +3.1 ; Li^+, –2.7; Na^+,+0.2; K^+, +0.9 ; Rb^+, +0.2; Cs^+, –0.6;	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]

Table 11: Ba^{2+}-Selective Electrodes (*Continued*)

ionophore	membrane composition	$\lg K_{Ba^{2+},B^{n+}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
		NH_4^+, –0.8; Mg^{2+}, –4.6; Ca^{2+}, –1.7; Sr^{2+}, –0.3							
	Ba^{2+}-5 (w = 1.2 %), oNPOE (w = 65.0 %), KTpClPB (x_i = 67 %), PVC (w = 33.1 %)	H^+, –2.7 ; Li^+, –3.3; Na^+,–2.5; K^+, –2.7; Rb^+, –2.9; Cs^+, –3.0; NH_4^+, –3.3; Mg^{2+}, –7.5; Ca^{2+}, –1.5; Sr^{2+}, +0.3	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
Ba^{2+}-6	**Ba^{2+}-6** (w = 1.2 %), oNPOE (w = 65.6 %), PVC (w = 33.2 %)	H^+, +3.0; Li^+, –2.4; Na^+, +0.2; K^+, +1.8 ; Rb^+, +1.2; Cs^+, +0.2; NH_4^+, –0.3; Mg^{2+}, –4.5; Ca^{2+}, –1.9; Sr^{2+}, +0.2	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
	Ba^{2+}-6 (w = 1.7 %), oNPOE (w = 64.8 %), KTpClPB (x_i = 63 %), PVC (w = 32.6 %)	H^+, –3.0 ; Li^+, –3.1; Na^+,–2.7; K^+, –2.9; Rb^+, –3.0; Cs^+, –2.9; NH_4^+, –3.5; Mg^{2+}, –4.8; Ca^{2+}, –1.5; Sr^{2+}, +0.6	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
Ba^{2+}-7	**Ba^{2+}-7** (w = 1.0 %), oNPOE (w = 66.2 %), PVC (w = 32.8 %)	H^+, +3.6 ; Li^+, –1.9; Na^+,+0.5; K^+, +1.3; Rb^+, +0.7; Cs^+, +0.1; NH_4^+, –0.1; Mg^{2+}, –4.3; Ca^{2+}, –3.0; Sr^{2+}, –2.5	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
	Ba^{2+}-7 (w = 1.2 %), oNPOE (w = 65.0 %), KTpClPB (x_i = 64 %), PVC (w = 33.1 %)	H^+, –3.0; Li^+, –2.9; Na^+,–1.9; K^+, –1.6; Rb^+, –2.0; Cs^+, –2.5; NH_4^+, –2.4; Mg^{2+}, –7.5; Ca^{2+}, –3.3; Sr^{2+}, –2.7	SSM	0.1	0.1	nN	–	20 °C; r.o.o.g.	[1]
Ba^{2+}-8	**Ba^{2+}-8** (w = 0.5 %), oNPPE (w = 67.6 %), PVC (w = 31.9 %)	Li^+,–0.3; Na^+, +0.7; K^+, +3; Mg^{2+}, –1.9; Ca^{2+}, –1.6	SSM	10^{-2}	10^{-2}	–	–	r.o.o.g.	[2]
Ba^{2+}-9	**Ba^{2+}-9** (w = 0.5 %), oNPPE (w = 67.6 %), PVC (w = 31.9 %)	Li^+,–0.3; Na^+, +4; K^+, +7; Mg^{2+}, –1.6; Ca^{2+}, –1.9	SSM	10^{-2}	10^{-2}	–	–	r.o.o.g.	[2]
Ba^{2+}-10	**Ba^{2+}-10** (w = 0.5 %), oNPPE (w = 67.6 %), PVC (w = 31.9 %)	Li^+,+0.4; Na^+, +1; K^+, +6; Mg^{2+}, –1.9; Ca^{2+}, –1.3	SSM	10^{-2}	10^{-2}	–	–	r.o.o.g.	[2]

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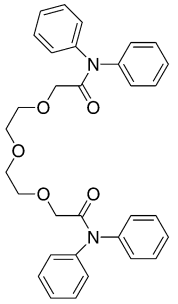
Table 11: Ba^{2+}-Selective Electrodes (*Continued*)

ionophore	membrane composition	$\lg K_{Ba^{2+},B^{n+}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
Ba^{2+}-11	**Ba^{2+}-11** (w = 0.5 %), oNPPE (x_i = 67.6 %), PVC (w = 31.9 %)	Li^+,+0.4; Na^+, +1.3; K^+, +2.5; Mg^{2+}, –1.0; Ca^{2+}, –0.7	SSM	10^{-2}	10^{-2}	–	–	r.o.o.g.	[2]
Ba^{2+}-12	**Ba^{2+}-12** (0.5 %), oNPPE (w = 67.6 %), PVC (w = 31.9 %)	Li^+, –1.4; Na^+, +0.2; K^+, +2.5; Mg^{2+}, –3.7; Ca^{2+}, –3.2	SSM	10^{-2}	10^{-2}	–	2.6×10^{-3} –4.3×10^{-2}	r.o.o.g.	[2]
Ba^{2+}-13	**Ba^{2+}-13** (w = 0.5 %), oNPPE (w = 67.6 %), PVC (w = 31.9 %)	Li^+, –1.5; Na^+, +0.2; K^+, +2.2; Mg^{2+}, –2.9 Ca^{2+}, –2.5	SSM	10^{-2}	10^{-2}	–	–	r.o.o.g.	[2]
Ba^{2+}-14	**Ba^{2+}-14** (w = 0.5 %), oNPPE (w = 67.6 %), PVC (w = 31.9 %)	Li^+, +0.4; Na^+, +0.5; K^+, +2.7; Rb^+, +2.1; Cs^+, +1.8; Mg^{2+}, –1.8; Ca^{2+}, –1.2	SSM	10^{-2}	10^{-2}	–	–	r.o.o.g.	[2]
Ba^{2+}-15	**Ba^{2+}-15** (w = 0.5 %), oNPPE (w = 67.6 %), PVC (w = 31.9 %)	Li^+, –0.4; Na^+, +0.7; K^+, +1.4; Mg^{2+}, –2.0; Ca^{2+}, –1.6	SSM	10^{-2}	10^{-2}	–	–	r.o.o.g.	[2]
Ba^{2+}-16	**Ba^{2+}-16** (w = 0.5 %), oNPPE (w = 67.6 %), PVC (w = 31.9 %)	Li^+, +0.3; Na^+, +0.5; K^+, +1.6; Rb^+, +1.5; Cs^+, +1.5; Mg^{2+}, –1.8; Ca^{2+}, –1.3	SSM	10^{-2}	10^{-2}	–	–	r.o.o.g.	[2]
Ba^{2+}-17	**Ba^{2+}-17** (7 mg), oNPOE (1 mL), poly(ethylene)–poly(vinyl acetate) (30 mg), NaTPB (x_i = 12–24 %)	Li^+, –3.6; Na^+, –2.4; K^+, –2.1; Rb^+, –2.5; Cs^+, –2.1; NH_4^+, –2.4; Mg^{2+}, –4.7; Ca^{2+}, –2.5; Sr^{2+}, –1.9; Mn^{2+}, –4.7 Cu^{2+}, –4.5; Zn^{2+}, –4.5	SSM	0.1	0.1	30.0	3×10^{-6} –10^{-1}	τ > 150 d; 1.6 < pH < 8.1; $c_{dl} = 2 \times 10^{-6}$ M; r.o.o.g.	[3]
		Li^+, –3.6; Na^+, –2.2; K^+, –1.4; Rb^+, –2.0; Cs^+, –2.1; NH_4^+, –2.1; Mg^{2+}, –4.6; Ca^{2+}, –2.4; Sr^{2+}, –1.5; Mn^{2+}, –4.6; Cu^{2+}, –4.5; Zn^{2+}, –4.1	FIM	–	–			r.o.o.g	[3]
	Ba^{2+}-17 (3 mg), oNPOE (1 mL), ethylene-vinyl acetate (30 mg), NaTPB (x_i = 28–56 %)	Li^+, –2.0; Na^+, –1.1; K^+, –0.4; NH_4^+, +0.0; Ca^{2+}, –0.9; Sr^{2+}, –2.4; Mn^{2+}, –3.0	SSM	0.1	0.1	–	–	r.o.o.g.	[3]

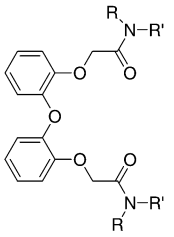
Table 11: Ba^{2+}-Selective Electrodes (*Continued*)

ionophore	membrane composition	$\lg K_{Ba^{2+},B^{n+}}$	method	primary ion conc. (M)	interfering ion conc. (M)	slope (mV/ decade)	linear range (M)	remarks	ref.
	Ba^{2+}-17 (7 mg?), nitrobenzene (1 mL), ethylene-vinyl acetate (30 mg), NaTPB (x_i = 12–24 %?)	Na^+, –1.6; K^+, –1.4; Rb^+, –1.8; Ca^{2+}, –2.3; Sr^{2+}, –1.3; Mn^{2+}, –4.5	SSM	0.1	0.1	–	–	short lifetime; r.o.o.g.	[3]
	Ba^{2+}-17 (7 mg?), DOPP (1 mL), ethylene-vinyl acetate (30 mg), NaTPB (x_i = 12–24 %?)	Li^+,+1.0; Na^+, –0.6; K^+, –0.4; NH_4^+, 0.8; Ca^{2+}, +0.2; Sr^{2+}, +0.0; Mn^{2+}, –1.6	SSM	0.1	0.1	–	–	r.o.o.g.	[3]

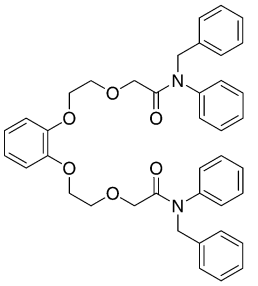
(1) T.Kleiner, F. Bongardt, F. Vögtle, M.W. Läubli, O. Dinten, W. Simon, *Chem. Ber.*, **118,** 1071–1077 (1985).
(2) Y.P. Feng, G. Goodlet, N.K. Harris, M.M. Islam, G.J. Moody, J.D.R. Thomas, *Analyst*, **116**, 469–472 (1991).
(3) A.A. Bouklouze, J.-C. Viré, V. Cool, *Anal. Chem. Acta,* **273**, 153–163 (1993).



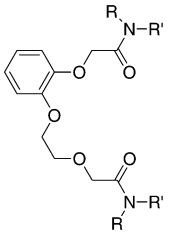
Ba^{2+}-1 (M_r = 524.62)



Ba^{2+}-2 (M_r = 648.76): R = C_6H_5, R' = $CH_2C_6H_5$
Ba^{2+}-3 (M_r = 620.71): R = R' = C_6H_5
Ba^{2+}-4 (M_r = 644.90): R = R' = cyclohexyl



Ba^{2+}-7 (M_r = 644.77)



Ba^{2+}-5 (M_r = 600.72): R= C_6H_5, R'= $CH_2C_6H_5$
Ba^{2+}-6 (M_r = 572.62): R= R'= C_6H_5

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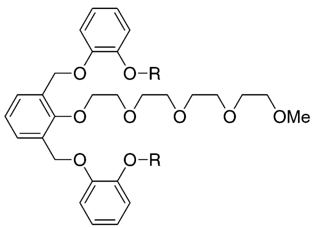
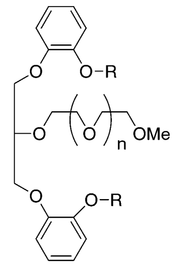
Table 11: Ba^{2+}-Selective Electrodes (*Continued*)



Ba^{2+}-8 (M_r = 740.86): R= C_6H_4 OCH_3
Ba^{2+}-9 (M_r = 680.80): R= C_6H_5



Ba^{2+}-10 (M_r = 646.78): R=Benzyl, n=3

Ba^{2+}-11 (M_r = 422.48): R=H, n=2

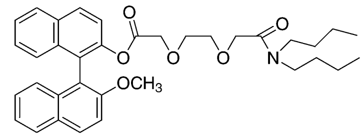
Ba^{2+}-12 (M_r = 466.53): R=H, n=3

Ba^{2+}-13 (M_r = 510.59): R=H, n=4

Ba^{2+}-14 (M_r = 554.64): R=H, n=5

Ba^{2+}-15 (M_r = 582.61): R=CH_2COOH, n=3

Ba^{2+}-16 (M_r = 626.66): R=CH_2COOH, n=4



Ba^{2+}-17 (M_r = 571.72)