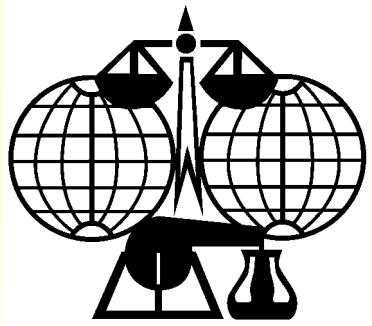


INFORMATION ESSENTIAL FOR CHARACTERIZING A FLOW-BASED ANALYTICAL SYSTEM

Poster presented at the
IUPAC Congress/General Assembly
July 2001

INTRODUCTION

- Classificaton and definition of flow-based analytical methods

Existing terminology → incomplete / ambiguous

- Analytical procedures and related instrumentation

Often partially described

- IUPAC recommendations

[*Pure Appl. Chem.* **66** (1994) 2493]

Complementation required

OBJECTIVES

- Guidelines for characterizing a flow analyzer and related methods

- Minimal requirements for scientific or technical reports

- Checklist to strengthen the tendency toward normalization

CONTENTS

- Elements to be considered for proper description of the flow system
- Description of the components of the system
  establishment of the flowing streams
  sample introduction (possibility of reagent introduction)
  manifold
  sample processing
  detection
- Performance (figures of merit)
  sampling rate, accuracy, sensitivity, detection limit, selectivity,dynamic range, precision, robustness, portability
- Recommendations concerning essential, redundant information
- Meaning of absence of information

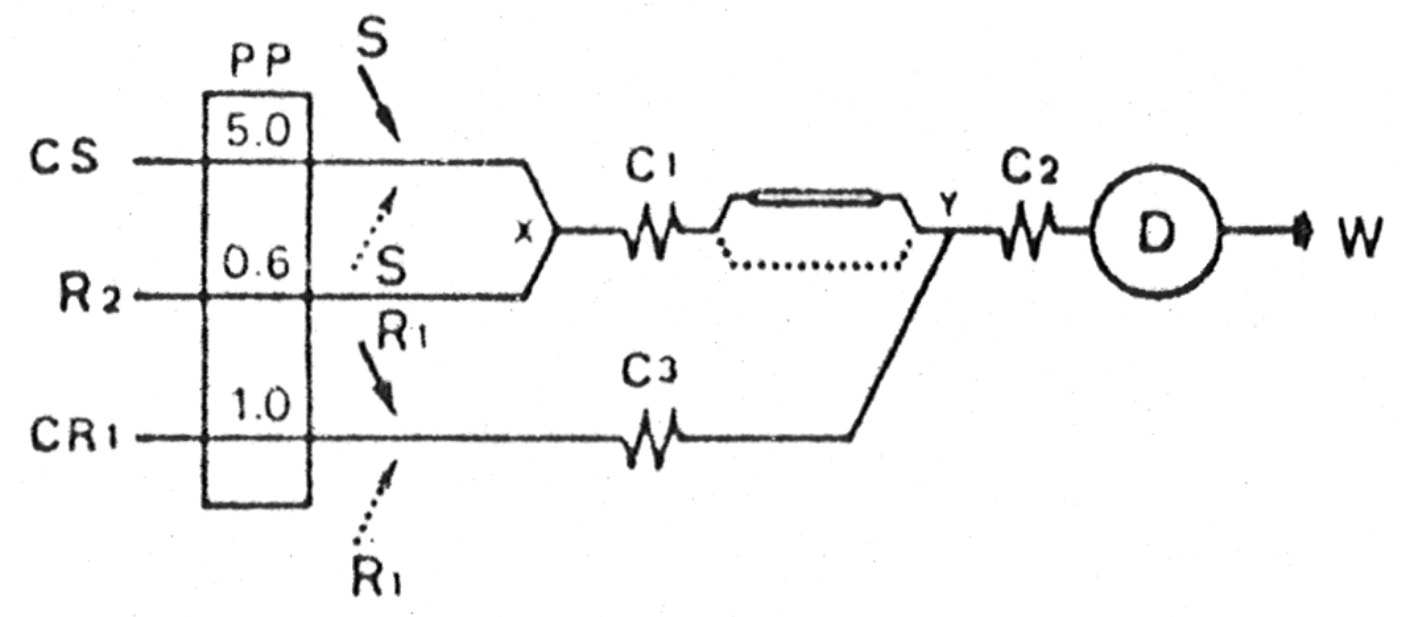
PRACTICAL EXAMPLE

Here, the project is exemplified by taking into account a classical article* prepared by the group led by H. Bergamin F^{o}, which originally exploited the concept of commutation and the use of immobilized reagents in flow-injection analysis. Nitrate and nitrite were sequentially determined.

* *Anal. Chim. Acta* **114** (1980) 191

citations: ~150 [ISI - 2001]

FLOW DIAGRAM - original system



C_s(water) and C_{R1} (phosphoric acid) = carrier streams for the sample (S) and color-forming reagent (R_1)

R_2 = masking/buffering reagent

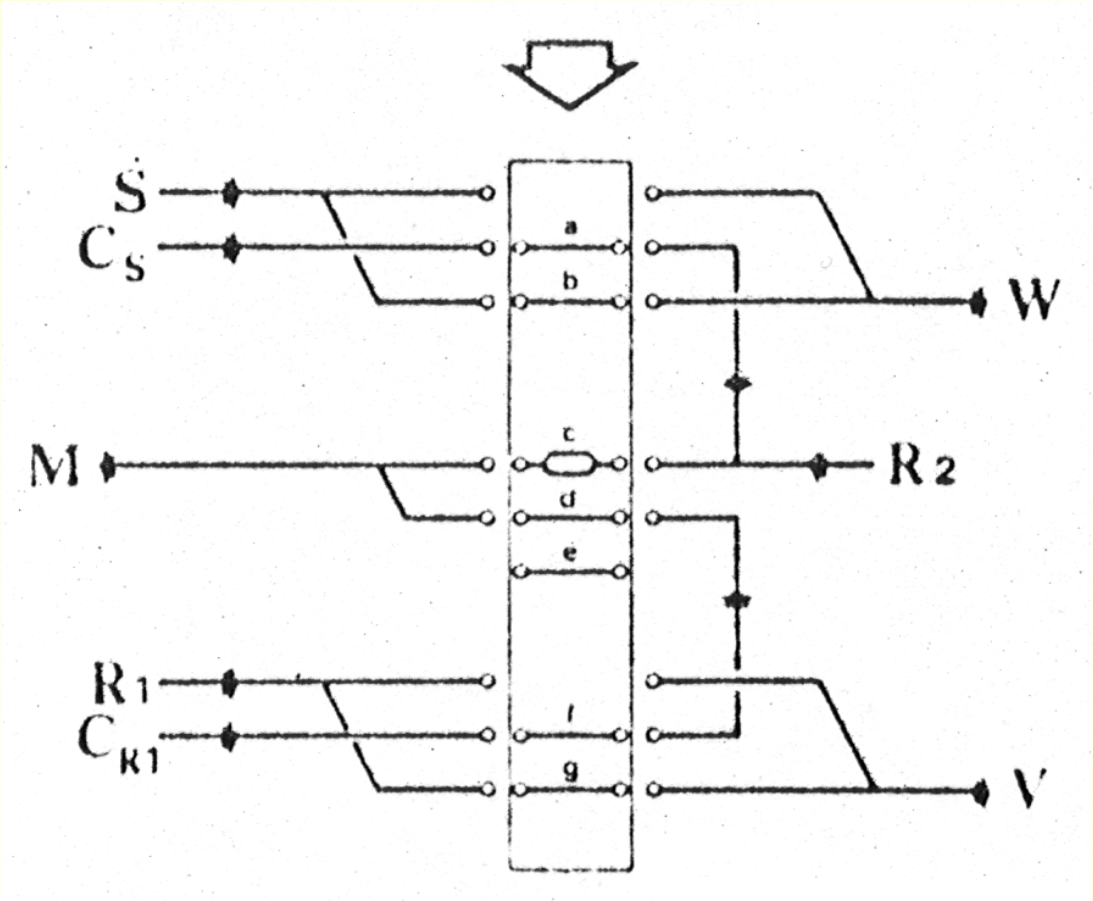
PP = peristaltic pump with flow rates in ml min^{-1}

C_1, C_2, C_3 = 15, 150, 15-cm coils

D = detector; W = waste

Column placed between C_1 and C_2

DIAGRAM OF THE INJECTOR - COMMUTATOR



a, b = sampling loops; *c* = reducing column;*d, e* = connectors; *f, g* = reagent loops; *M* = manifold

INFORMATION

Original	Recommended
PUMP	
as in earlier work	nihil
REACTOR	
as in earlier work diameter	specify winding
VALVE	
injector commutator	specify building-up or mention manufacturer
FLOW DIAGRAM	
two illustrations	one figure

DETECTOR

wavelength, optical path, inner volume

add illuminated volume

FIGURES OF MERIT

accuracy, precision, sampling rate, drift, % NO_3 reduction

add dispersion coefficient

residence times (total - inside column)

GENERAL

nihil

mention available commercial devices

FIA (BIA,SIA,TAS,...)

flow analysis

CONCLUSIONS

- Tendency to normalization
- Easier implementation of a given method to other analyzer
- Reduction of redundant information
- Enhanced suitability for less skilled analysts

Task group

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