

IC Application Note No. S-242

Title: Trace analysis of anions in the primary circuit of a nuclear power plant (PWR) applying Metrohm Inline Sample Preparation

Summary: Determination of fluoride, chloride, glycolate, acetate, formate, nitrite, nitrate, and sulfate in the primary circuit water of a pressurized water reactor (PWR) using anion chromatography with conductivity detection after chemical suppression calibrated with Metrohm Inline Calibration.

Sample: Synthetic primary circuit water containing 2.5 g/L boron as boric acid

Sample Preparation: Metrohm Inline Matrix Neutralization

Column: 6.1006.630 Metrosep A Supp 7 – 250
6.1006.310 Metrosep A PCC 1 HC (preconcentration)

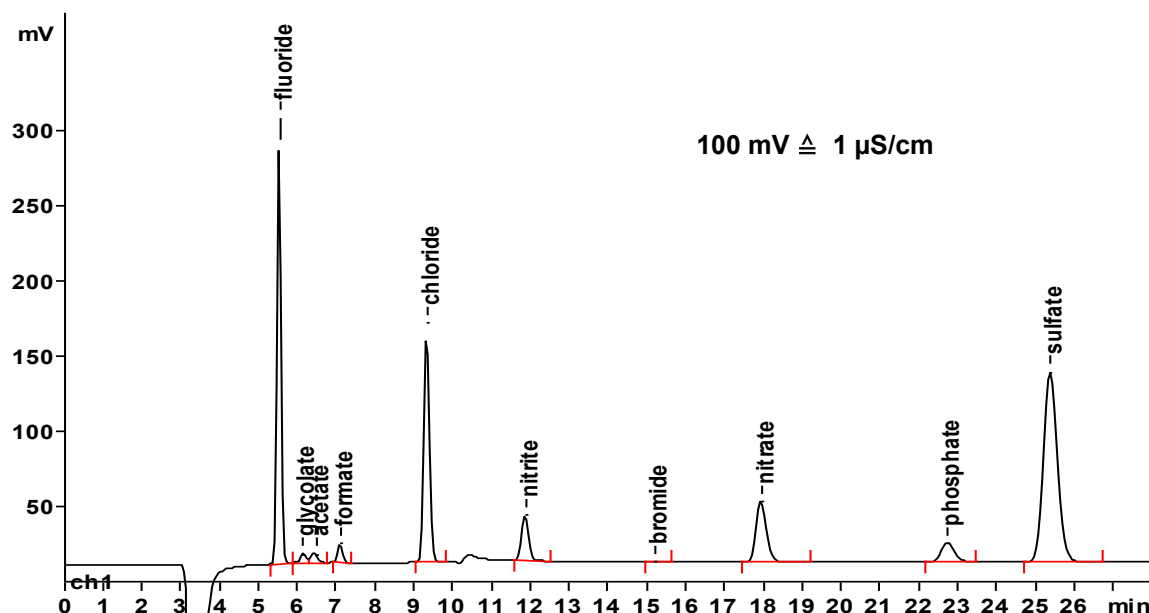
Eluent: 3.6 mmol/L sodium carbonate

Suppressor: Metrohm Suppressor Module (MSM, 50 mmol/L sulfuric acid)

Sample Prep.: 100 mmol/L citric acid, 10% acetone

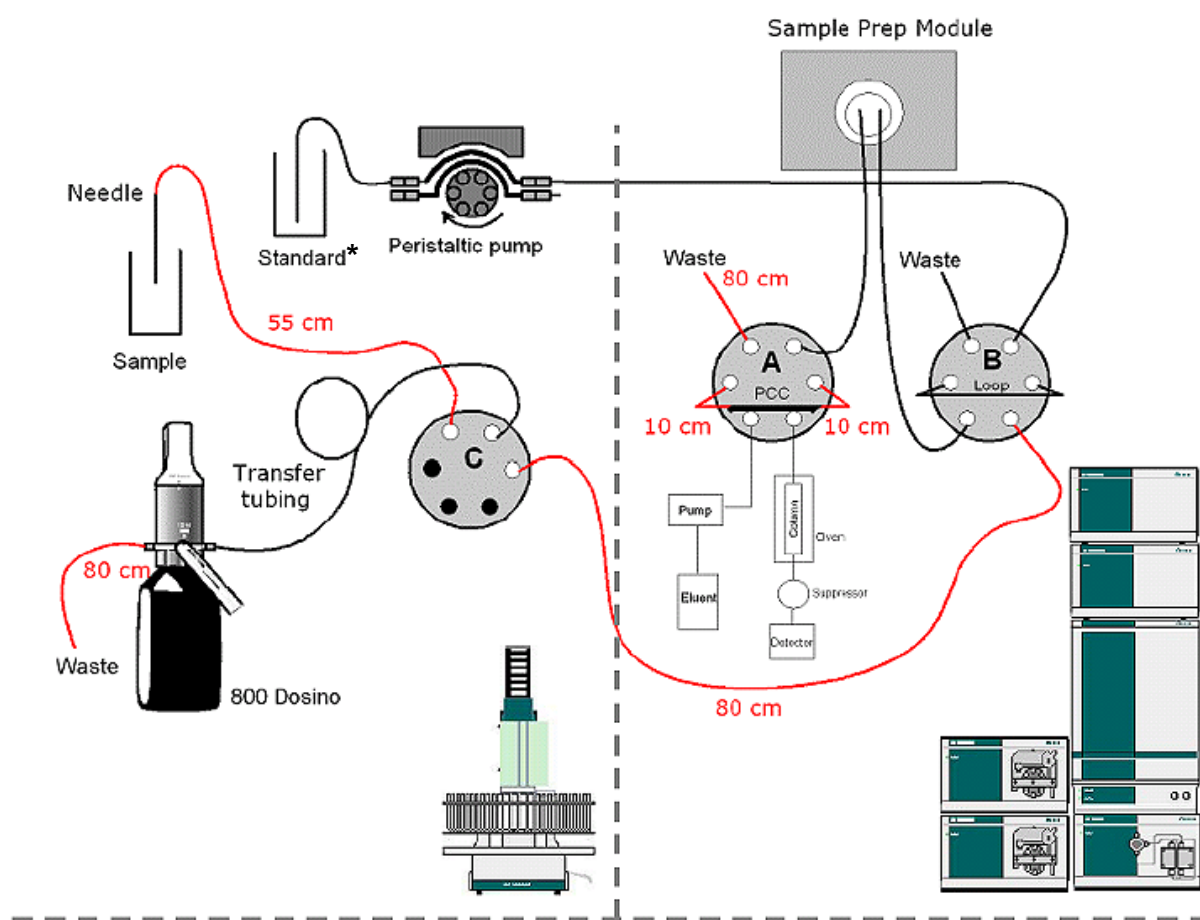
Flow: 0.8 mL/min

Injection Volume: 2.0 mL preconcentrated



Results:	F ⁻ µg/L	Glycolate µg/L	Acetate µg/L	Formate µg/L	Cl ⁻ µg/L	NO ₂ ⁻ µg/L	Br ⁻ µg/L	NO ₃ ⁻ µg/L	PO ₄ ³⁻ µg/L	SO ₄ ²⁻ µg/L
	20.2	3.6	9.7	3.1	25.5	10.8	n.q.	22.3	17.8	69.7

System setup for Metrohm Inline Preconcentration with Inline Matrix Neutralization and Inline Calibration:



838 Advanced IC Sample Processor

MIC 6 Advanced IC System

* Standard solution for Inline Calibration