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Eluent Preparation for First-Generation Dionex Columns

INTRODUCTION

As Dionex continues to develop new chromatography products, we replace many of the older methods with improved methods using columns that exhibit higher efficiency and improved selectivity. This Technical Note is a reference for those who are using the older methods and

products. Recommended applications and conditions are listed below. In many cases, the column or suppressor is no longer available; however, old part numbers are listed with each product for reference. For a more complete listing of current products, refer to the Dionex *Product Selection Guide*.

Anion Determination

Column	Application	Eluent	Reagents Required for 4 L
HPIC-AS1 P/N 30827	Inorganic anions	0.003 M NaHCO ₃ 0.0024 M Na ₂ CO ₃	1.0 g 1.0 g
IonPac® AS2 P/N 43192 (replaces P/N 31019)	Inorganic anions in nitric acid digests	0.003 M Na ₂ CO ₃ 0.002 M NaOH – or – 5% (v/v) acetonitrile (CH ₃ CN) 0.00071 M 4-cyanophenol 0.002 M NaOH 0.0045 M Na ₂ CO ₃	1.3 g 80 mL of 0.1 M NaOH 200 mL 0.36 g 80 mL of 0.1 M NaOH 1.9 g
IonPac AS3 P/N 43181 (replaces P/N 30985)	Inorganic anions	0.0028 M NaHCO ₃ 0.0022 M Na ₂ CO ₃	0.94 g 0.93 g
IonPac AS4 P/N 35311	Inorganic anions	0.0028 M NaHCO ₃ 0.0022 M Na ₂ CO ₃	0.94 g 0.93 g
IonPac AS7 P/N 35393	Chelating anions	0.06 M HNO ₃ Postcolumn reagent: Fe(NO ₃) ₃ • 9H ₂ O HClO ₄ , 2% v/v	15 mL concentrated Ultrex-grade HNO ₃ 1g/L 20 mL/L of 70–72% acid

Anion Suppression Systems		
Column	Regenerant	Reagents for 4 L
ASC-1, P/N 30829	0.10 N HCl	33 mL conc. HCl
ASC-2, P/N 30828	0.10 N HCl	33 mL conc. HCl
AFS, P/N 35350	0.025 N H ₂ SO ₄	2.8 mL of conc. H ₂ SO ₄
AFS-2, P/N 35358	0.005 N H ₂ SO ₄ for ion-pairing applications	0.6 mL of conc. H ₂ SO ₄

Cation Separation			
Column	Application	Eluent	Reagents for 4 L
HPIC-CS1 P/N 30831	Monovalent cations	0.005 M HCl	1.6 mL of conc. HCl or 20 mL of 1 M HCl
	Divalent cations	0.0015 M HCl 0.0015 M <i>meta</i> -phenylenediamine dihydrochloride (<i>m</i> -PDA • 2HCl)	0.50 mL of conc. HCl 1.1 g of <i>m</i> -PDA • 2HCl
HPIC-CS2 P/N 35371	Transition metals	0.010 M oxalic acid 0.0075 M trilitium citrate Adjust pH to 4.15 with LiOH or 3 M HCl Postcolumn reagent: 0.2 mM 4-(2-pyridylazo)resorcinol monosodium salt, monohydrate (PAR) 3 M ammonium hydroxide 1 M acetic acid For high levels of metals (> 1 ppm) use 0.10 g/L PAR	5.0 g 8.4 g 0.05 g/L 207 mL/L 57 mL/L
	Monovalent cations	0.025 M HCl	8.3 mL of conc. HCl or 100 mL of 1 M HCl
	Divalent cations	0.025 M HCl 0.003 M 2,3-diaminopropionic acid hydrochloride (DAP • HCl)	8.3 mL of conc. HCl or 100 mL of 1 M HCl 1.7 g DAP • HCl

Cation Suppression Systems		
Column	Regenerant	Reagents for 4 L
CSC-1, P/N 30832	0.5 M NaOH	110 mL of NaOH solution, 50% w/w
CSC-2, P/N 30834	0.5 M NaOH	110 mL of NaOH solution, 50% w/w
CFS, P/N 35352	0.04 M tetramethylammonium hydroxide (TMAOH) – or –	30 g TMAOH • 5H ₂ O (tetramethylammonium hydroxide pentahydrate, 97%)
	0.04 M tetrabutylammonium hydroxide (TBAOH)	80 mL of 55% TBAOH solution

Organic Acid Determination

Column	Eluent	Reagents for 4 L
HPICE®-AS2, P/N 30888	0.001 M HCl or 0.005 M HCl for use with the ISC -or- 0.001-0.003 M octane sulfonic acid (OSA) for use with the AFS-2 or AMMS®-ICE	4 mL of 1 M HCl 20 mL of 1 M HCl Use Dionex 0.1 M OSA reagent, MPIC®-CR2, P/N 35362
HPICE-AS3, P/N 30890	Same as above	

Organic Acid Suppression Systems

Column	Regenerant	Reagents for 4 L
ISC, P/N 30891	For HCl eluent, replace ISC after it is expended—it cannot be regenerated	None



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