

Column 4	Purpose	Volume	Acid
5 mL of Eichrom Ln Spec 100-200 mesh resin			
	pre-clean	10 mL	1M HF
	pre-clean	15 mL	3M HCl
	pre-clean	15 mL	6M HCl
	pre-clean	5 mL	SQ water
	pre-condition	1.5 mL	3M HCl
	pre-condition	1.5 mL	3M HCl
	load sample, elute and collect Nd and Th	4.5 mL	3M HCl
	elute and collect Nd and Th	2.5 mL	3M HCl
	isolate Hf and elute remaining HFSE	10 mL	3M HCl
	isolate Hf and elute remaining HFSE	15 mL	3M HCl
	isolate Hf and elute remaining HFSE	10 mL	6M HCl
	isolate Hf and elute remaining HFSE	15 mL	6M HCl
	isolate Hf and elute remaining HFSE	0.5 mL	SQ water
	isolate Hf and elute remaining HFSE	20 mL	0.9M citric acid - 0.4 M HNO <sub>3</sub> - 1% H <sub>2</sub> O <sub>2</sub>
	isolate Hf and elute remaining HFSE	10 mL	0.9M citric acid - 0.4 M HNO <sub>3</sub> - 1% H <sub>2</sub> O <sub>2</sub>
	isolate Hf and elute remaining HFSE	0.5 mL	SQ water
	isolate Hf and elute remaining HFSE	5 mL	3M HCl - 0.1M HF
	isolate Hf and elute remaining HFSE	3 mL	3M HCl - 0.1M HF
	elute and collect Hf	14.5 mL	6M HCl - 0.3M HF

\* Modified from Fritz and Umbreit 1958,  
Munker et al. 2001, Aciego et al. 2009