

Supplementary Material

Chemically Differentiating Ascorbate-Mediated Dissolution of Quantum Dots in Cell Culture Media

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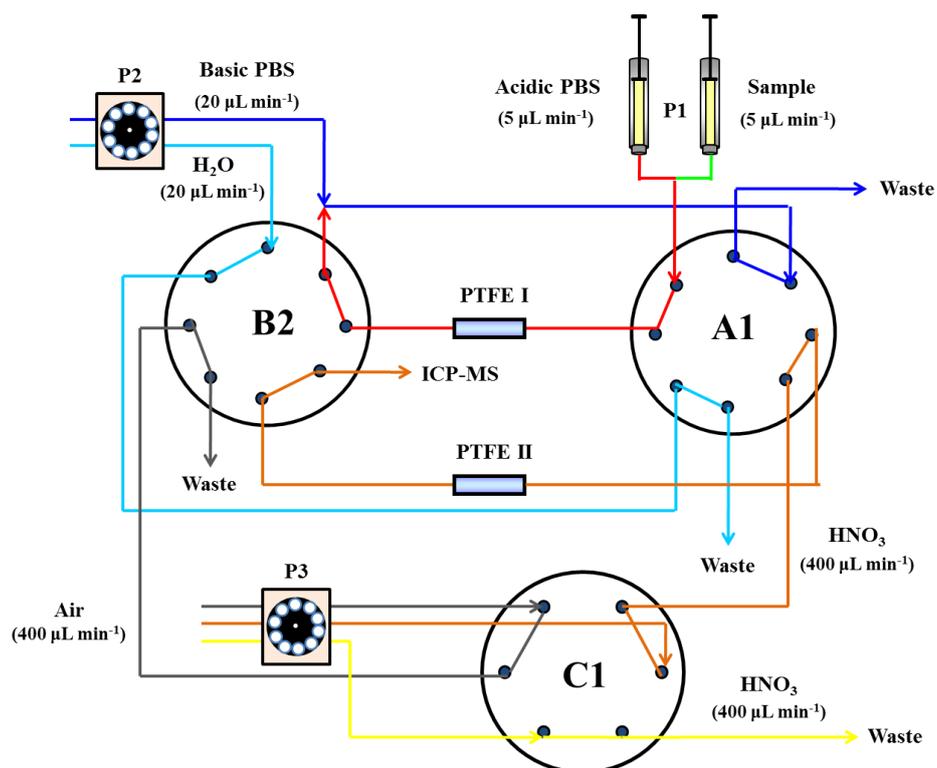
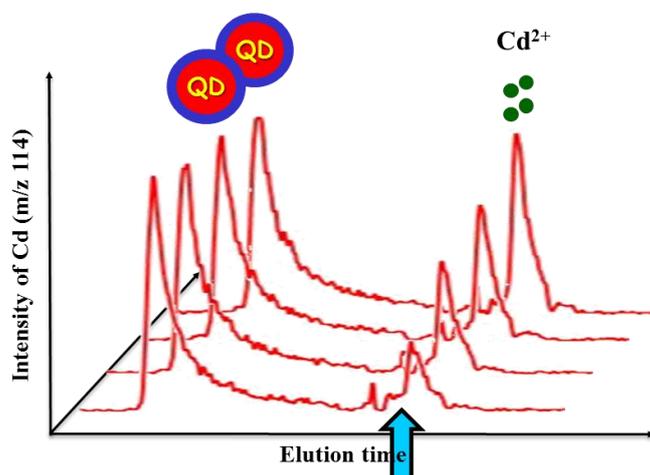
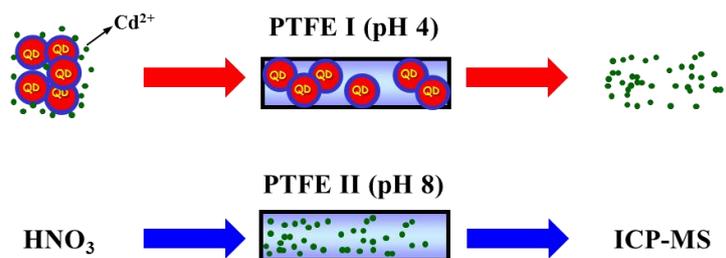


Figure S1. Step 1 (A1:B2:C1): fill acidified sample into PTFE I (red line); detach Cd^{2+} ions from PTFE II and deliver to ICP mass spectrometer (orange line).

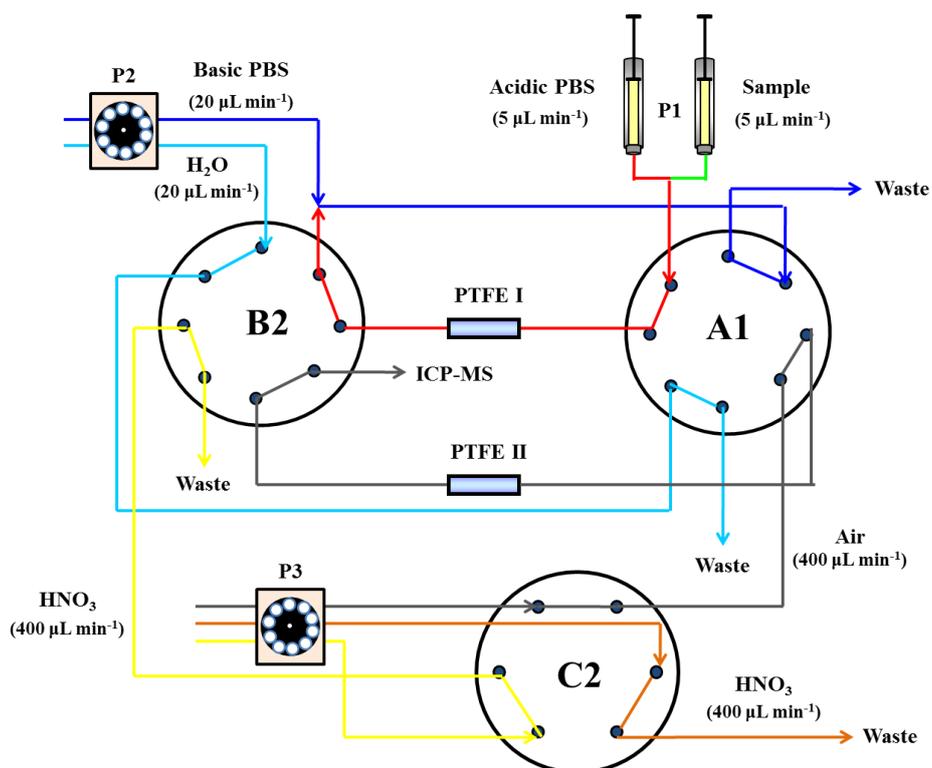
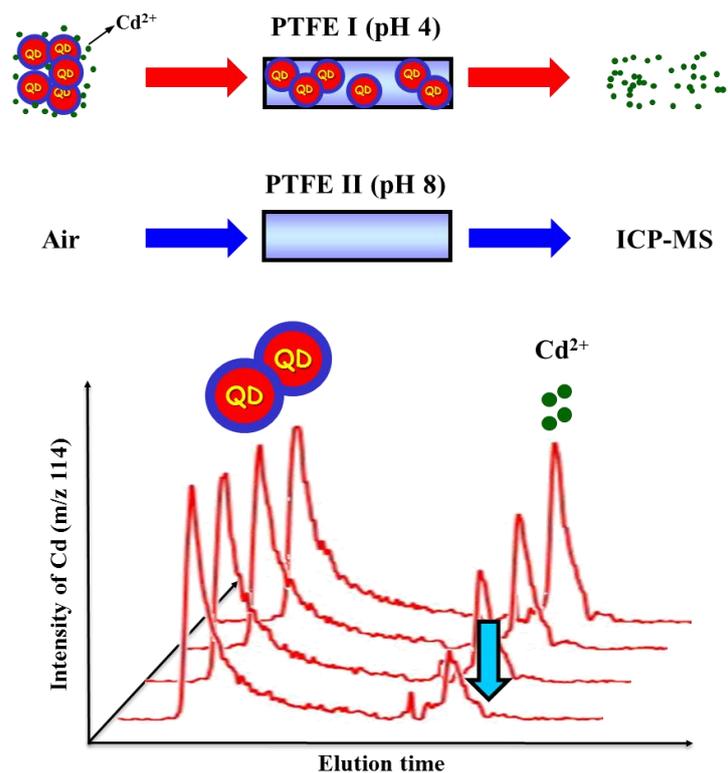


Figure S2. Step 2 (A1:B2:A2): fill acidified sample into PTFE I (red line); replace HNO₃ in PTFE II with air carrier stream (gray line).

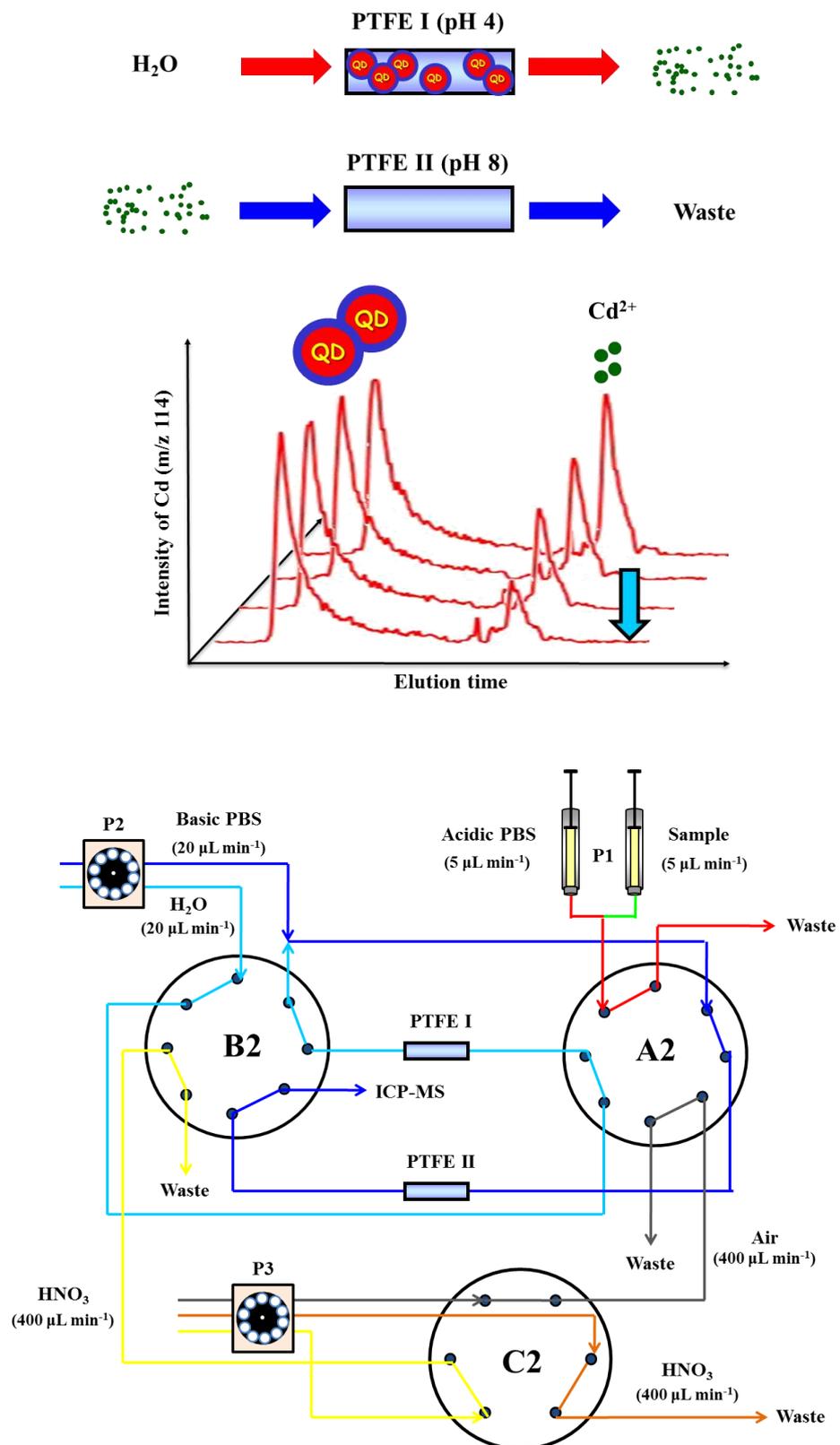


Figure S3. Step 3 (A2:B2:A2): remove sample from PTFE I (aqua blue line); deliver the sample buffered with basic PBS into PTFE II (blue line).

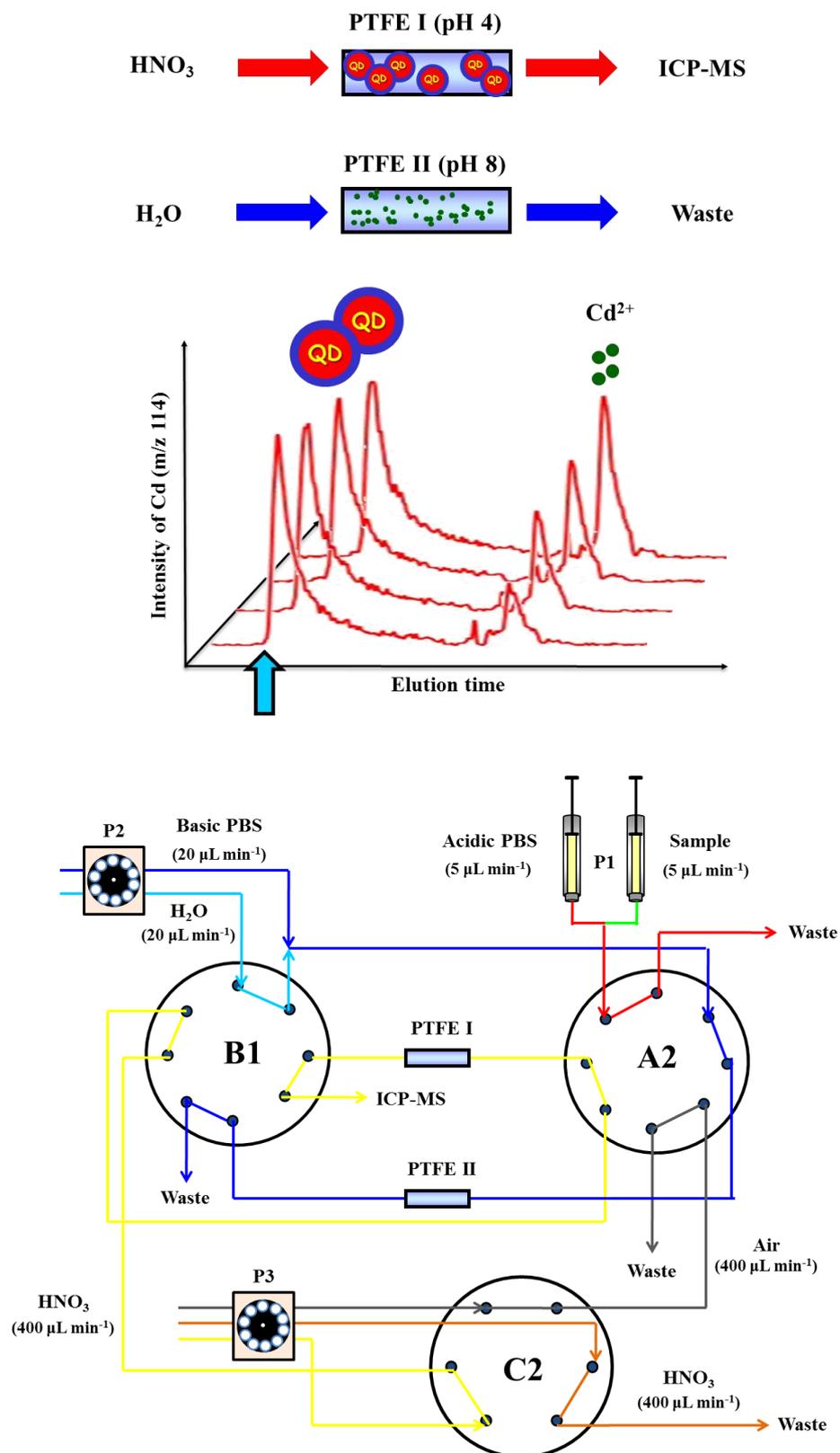


Figure S4. Step 4 (A2:B1:A2): detach QD705 from PTFE I and deliver to ICP mass spectrometer (yellow line); deliver the sample buffered with basic PBS into PTFE II (blue line).

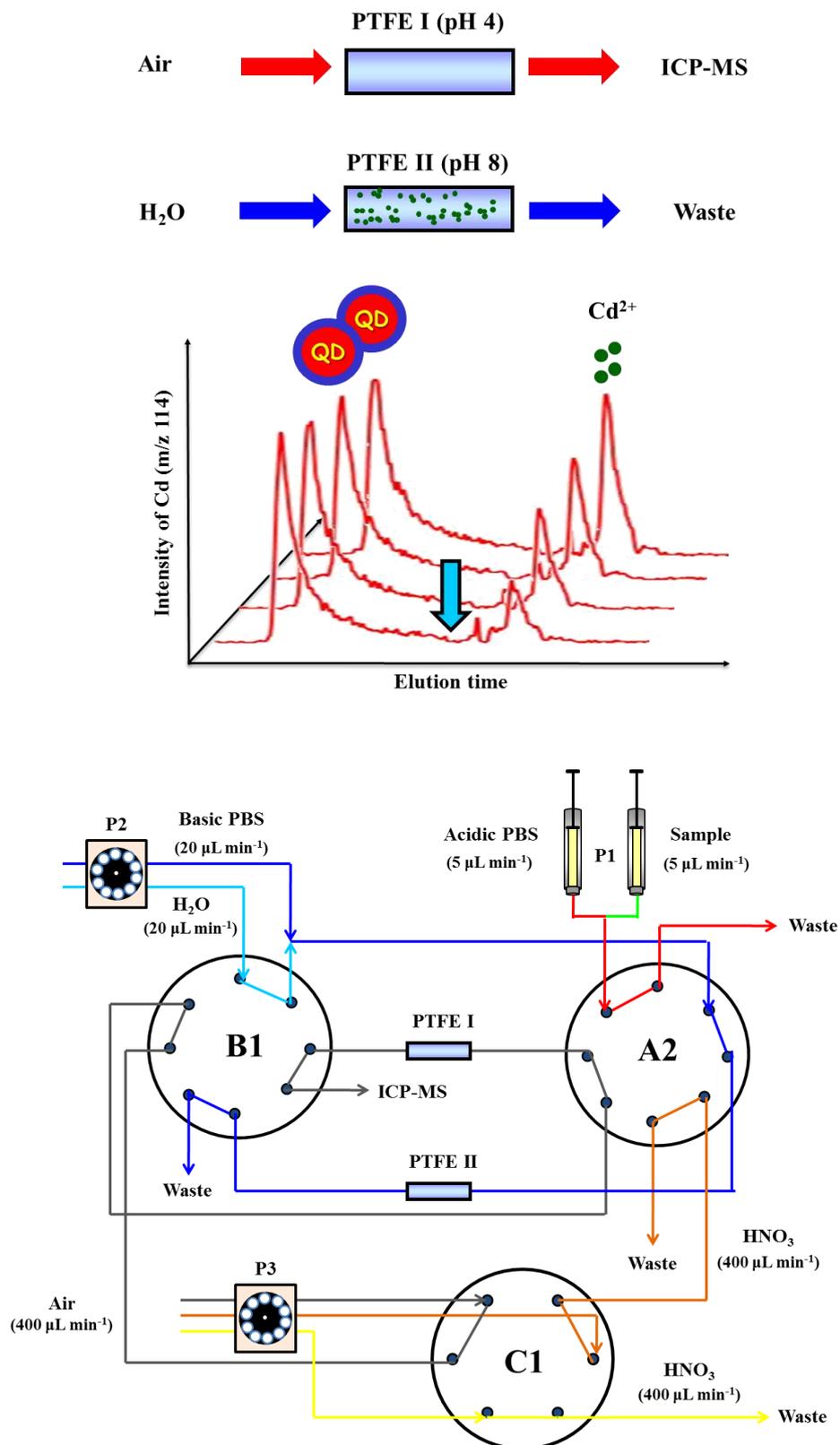


Figure S5. Step 5 (A2:B1:A1): replace HNO₃ in PTFE I with air carrier stream (gray line); then return to step 1.

Table S1. Operation sequence of the sequential in-tube PTFE SPE-ICP-MS hyphenated system

Step	Function	Valve position	Time, s	Medium delivered	Flow rate, $\mu\text{L min}^{-1}$
1	Fill acidified sample into PTFE I; detach Cd^{2+} ions from PTFE II and deliver to ICP mass spectrometer	A: 1 (load)	90	Sample	5
		B: 2 (injection)		Acidic PBS	5
		C: 1 (load)		HNO_3 , air	400
2	Fill acidified sample into PTFE I; replace HNO_3 in PTFE II with air carrier stream	A: 1 (load)	30	Sample	5
		B: 2 (injection)		Acidic PBS	5
		C: 2 (injection)		HNO_3 , air	400
3	Remove sample from PTFE I; deliver the sample buffered with basic PBS into PTFE II	A: 2 (injection)	180	Sample	20
		B: 2 (injection)		Basic sample	40
		C: 2 (injection)			
4	Detach QD705 from PTFE I and deliver to ICP mass spectrometer	A: 2 (injection)	150	HNO_3 , air	400
		B: 1 (load)		Basic sample	40
		C: 2 (injection)			
5	Replace HNO_3 in PTFE I with air carrier stream	A: 2 (injection)	30	HNO_3 , air	400
		B: 1 (load)		Basic sample	40
		C: 1 (load)			

Table S2. Optimized parameters for sequential in-tube PTFE SPE-ICP-MS hyphenated system

Sequential in-tube SPE device	
PTFE tubing I	200 cm, 0.007 inch
PTFE tubing II	200 cm, 0.02 inch
Acidic buffer for mixing	10 mM PBS, pH 3.7 for saline sample
	10 mM PBS, pH 1.5 for DMEM + 10% FBS
Basic buffer for mixing	5 mM PBS, pH 9.2 for saline sample
	5 mM PBS, pH 11.1 for DMEM + 10% FBS
Sample loading	5 $\mu\text{L min}^{-1}$
Acidic buffer flow rate	5 $\mu\text{L min}^{-1}$
Basic buffer flow rate	20 $\mu\text{L min}^{-1}$
Eluent	2% HNO_3
Elution flow rate	400 $\mu\text{L min}^{-1}$
Sampling frequency	7.5 h^{-1}
ICP-MS	
ICP mass spectrometer	Agilent 7500a
Ar gas flow rates	
Plasma	15 L min^{-1}
Auxiliary	0.9 L min^{-1}
Nebulizer	1.03 L min^{-1}
Make-up	0.12 L min^{-1}
Plasma forward power	1500 W
Sampling cone	Ni, 1-mm orifice
Skimmer cone	Ni, 0.4-mm orifice