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Supporting Information

Analysis of trace elements in uranium by inductively coupled plasma optical emission spectroscopy, design of experiments, and partial least squares regression

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Table S1. Elements in one trace 100 µg mL^{-1} standard.

Al	Cr	Fe	K	Tl
As	Co	La	Pr	Th
Ba	Cu	Pb	Re	Tm
Be	Dy	Li	Rb	U
Bi	Er	Lu	Sm	V
B	Eu	Mg	Sc	Yb
Cd	Gd	Mn	Se	Y
Ca	Ga	Nd	Na	Zn
Ce	Ho	Ni	Sr	
Cs	In	P	Tb	

Table S2. Elements in the second trace 100 µg mL^{-1} standard.

Sb	Ti
Ge	W
Hf	Zr
Mo	
Nb	
Si	
Ag	
Ta	
Te	
Sn	

Table S3. Additional samples included in the validation set (*i.e.*, quality controls).

Sample	Uranium (µg mL^{-1})	Trace (µg mL^{-1})	(µg/g)
1	1000	0.02	20
2	1000	0.05	50
3	1000	0.1	100
4	1000	0.25	250
5	1000	0.5	500
6	1000	1.5	1500

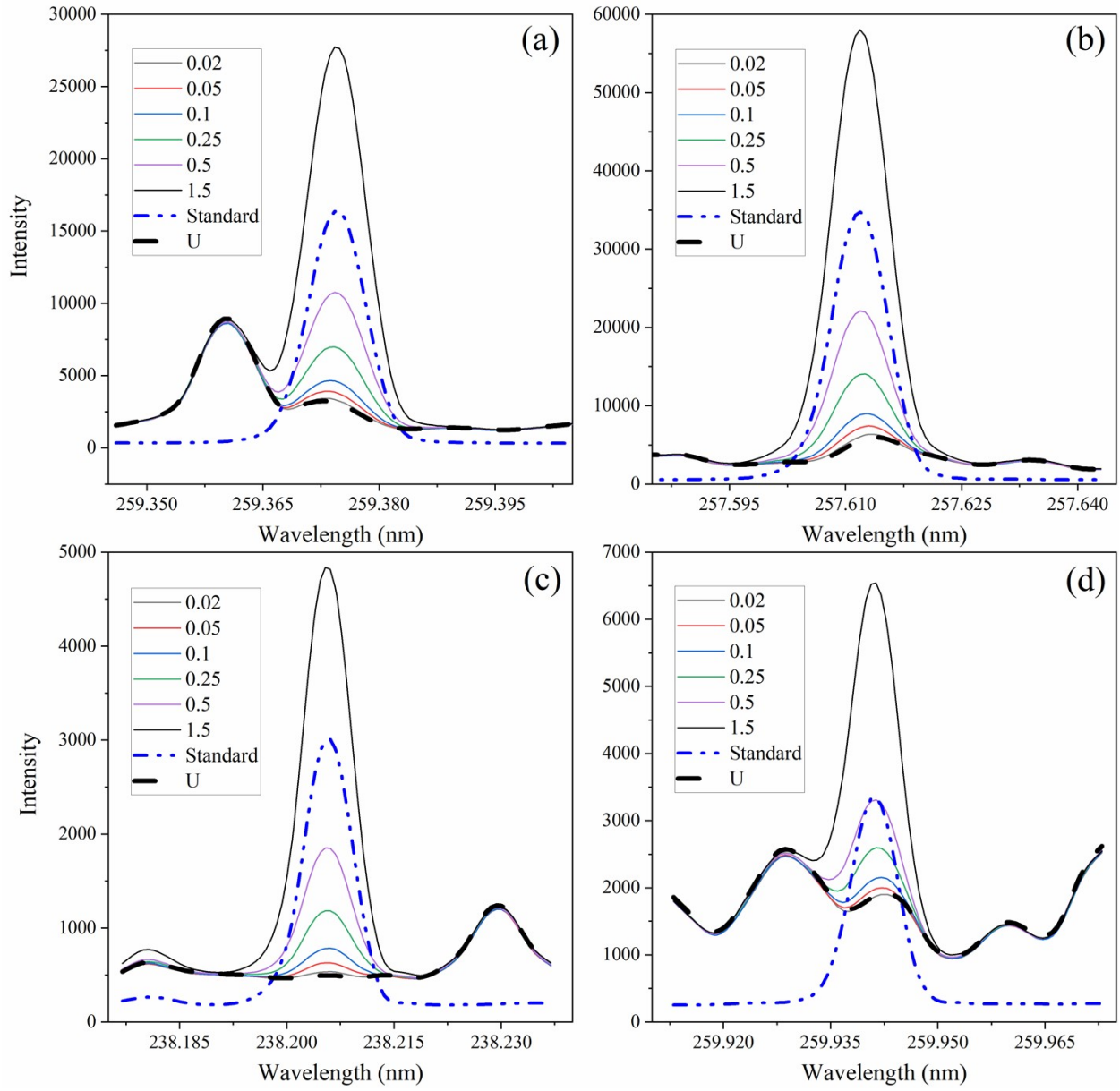

Figure S1. Optical emission spectra of trace elements from 0.02 to 1.5 µg mL^{-1} in 1000 µg mL^{-1} U for (a) Mn 259.37 nm, (b) Mn 257.61 nm, (c) Fe 238.20 nm, and (d) Fe 259.94 nm. Compared to a standard (1 µg mL^{-1} multielement) and a 1000 µg mL^{-1} U sample.

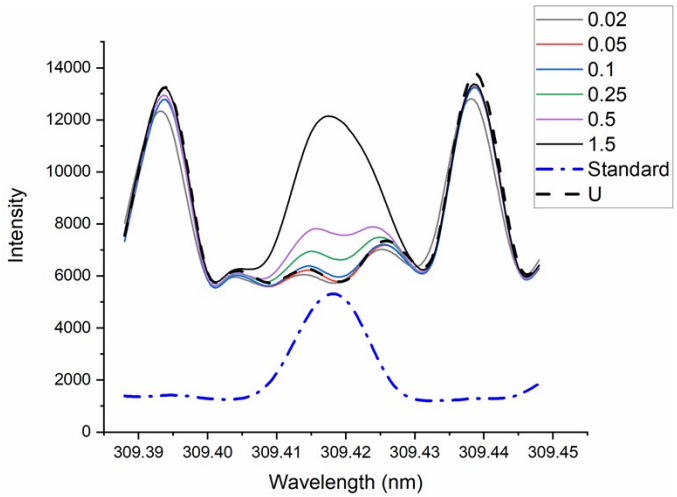

Figure S2. Optical emission spectra of Nb 309.42 nm 0.02 to 1.5 µg mL^{-1} in 1000 µg mL^{-1} U. Compared to a standard (1 µg mL^{-1} multielement) and a 1000 µg mL^{-1} U sample.

Table S4. Quality control samples to determine RMSE.

Sample	Trace (µg mL^{-1})	U (µg mL^{-1})	µg trace/g U
1	1.164	528.3	2208
2	1.454	762.4	1911
3	0.543	107.9	5055
4	0.776	344.5	2258
5	0.020	963.9	20
6	0.052	962.8	54
7	0.099	966.0	102
8	0.241	965.3	250
9	0.482	967.3	498
10	1.569	975.6	1608