

Table S1. Probability values obtained when applying ANOVA to the response studied with the Plackett–Burman design built for factor selection. The last columns show the recovery obtained at lower and upper levels.

	F-value	p-value^a	Recovery at the lower level	Recovery at the upper level
Model ^b	18.37	0.0029		
CYPHOS [®] IL 101 concentration (%)	24.38	0.0043 (+)	50.86	82.35
Ionic strength	21.24	0.0058 (-)	81.30	51.91
Ion-pair formation time (min)	8.45	0.0335 (-)	75.88	57.33
Solvent extraction volume (μL)	39.18	0.0015 (-)	86.56	46.64
Extraction time (min)	8.51	0.0331 (+)	57.30	75.91
Dummy variable	8.45	0.0335 (+)	57.33	75.87

^aConsidered significant when $p < 0.05$. Signs between parentheses correspond to the effects on the variables

^bStatistical significance of the linear model

Table S2. Central composite design used for the optimization of Cr recovery.

Run	Block	Concentration CYPHOS [®] IL 101 (%)	Ion-pair formation time (min)	Extraction time (min)	Solvent extraction volume (μL)	Recovery (%)
1	Day 1	5.25	7.625	5.75	75	97.4
2	Day 1	11.75	7.625	15.25	75	64.09
3	Day 1	8.50	5.250	10.5	60	104.36
4	Day 1	11.75	2.875	5.75	45	92.67
5	Day 1	11.75	7.625	15.25	45	88.00
6	Day 1	11.75	2.875	5.75	75	62.07
7	Day 1	5.25	7.625	5.75	45	96.07
8	Day 1	8.50	5.250	10.5	60	100.37
9	Day 1	11.75	7.625	5.75	75	79.03
10	Day 1	5.25	2.875	5.75	75	79.43
11	Day 1	11.75	2.875	15.25	75	99.17
12	Day 1	5.25	7.625	15.25	45	77.47
13	Day 1	5.25	2.875	15.25	75	85.63
14	Day 1	5.25	7.625	15.25	75	99.67
15	Day 1	8.50	5.250	10.5	60	102.00
16	Day 1	8.50	5.250	10.5	60	101.73
17	Day 1	11.75	7.625	5.75	45	99.67
18	Day 1	5.25	2.875	15.25	45	100.20
19	Day 1	5.25	2.875	5.75	45	96.27
20	Day 1	11.75	2.875	15.25	45	94.20
21	Day 2	8.50	0.500	10.50	60	73.90
22	Day 2	8.50	5.250	10.50	30	97.27
23	Day 2	8.50	5.250	10.50	90	63.08
24	Day 2	8.50	5.250	10.50	60	99.07
25	Day 2	8.50	5.250	1.00	60	69.05
26	Day 2	8.50	5.250	10.50	60	100.43
27	Day 2	8.50	10.000	10.50	60	101.67
28	Day 2	15.00	5.250	10.50	60	99.37
29	Day 2	2.00	5.250	10.50	60	71.27

30	Day 2	8.50	5.250	20.00	60	81.10
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Experimental value corresponding to run 11 was removed of the design matrix because it was an outlier.