Table 1. The symbols and levels of the CCD test design for chlorpyrifos extraction from the urine by liquid-liquid microextraction method

Factors	α+	1+	Zero	1-	α-
Methanol (µL)	1000	800	600	400	200
Salt (%)	4	3	2	1	0
Surfactant (%)	4	3	2	1	0
Toluene (µL)	525	450	375	300	225

Table 2. Optimization results of CCD-dispersive liquid microextraction method to increase the outcome of chlorpyrifos extraction from urine

Test No.	Volume of dispersive solvent (µL)	Extraction solvent volume (µL)	Surfactant Concentration (%)	Salt concentration (%)	Chloropyrifos outcome
1	800	400	3	3	90.63
2	600	300	4	2	75.91
3	600	100	2	2	63.09
4	1000	300	2	2	81.05
5	400	400	1	3	56.81
6	600	300	2	2	95.64
7	800	200	3	1	70.11
8	800	400	1	3	73.30
9	600	300	2	2	88.12
10	600	300	2	2	89.94
11	600	300	2	2	86.18
12	400	400	3	1	42.40
13	400	200	1	1	45.48
14	400	400	1	1	42.52
15	800	400	1	1	80.94
16	400	200	3	1	51.81
17	600	300	2	0	31.23
18	200	300	2	2	36.99
19	400	400	3	3	62.24
20	600	300	2	4	66.00
21	800	400	3	1	81.16
22	600	300	2	2	84.70
23	600	300	0	2	64.01
24	800	200	1	3	61.90
25	400	200	1	3	60.30
26	800	200	3	3	75.81
27	600	500	2	2	70.70
28	800	200	1	1	59.62
29	600	300	2	2	90.08
30	400	200	3	3	61.90

Table 3. Primary validation factors of the liquid-liquid microextraction method

Indices	Values
R2 coefficient of determination	0.956
Adjusted coefficient of determination	0.934
Standard deviation of experimental error	3.91
The model coefficient of variation	6.56
Mean	59.70
Pred R-Squared	0.872
Adeq Precision	19.086
PRESS	859.535

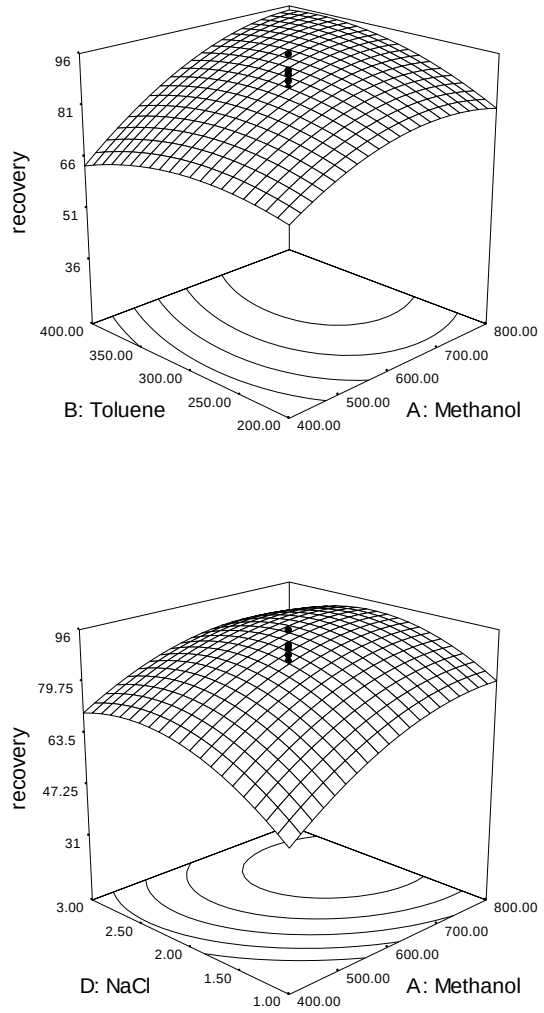

Figure 1. The results of response surface plots of the factors effective in increasing the chlorpyrifos extraction outcome from urine samples

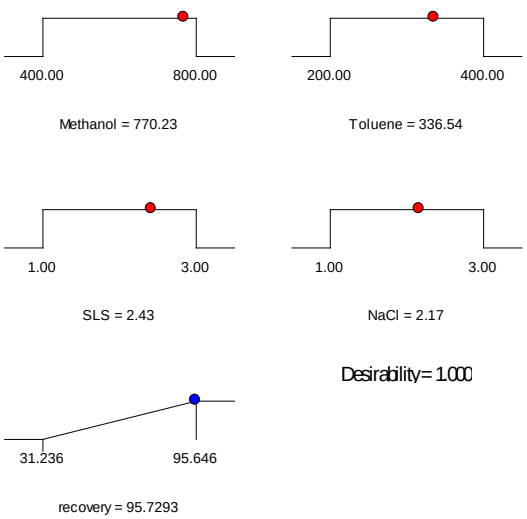

Figure 2. Schematic representation of the optimal values of the factors, responses, and associated levels

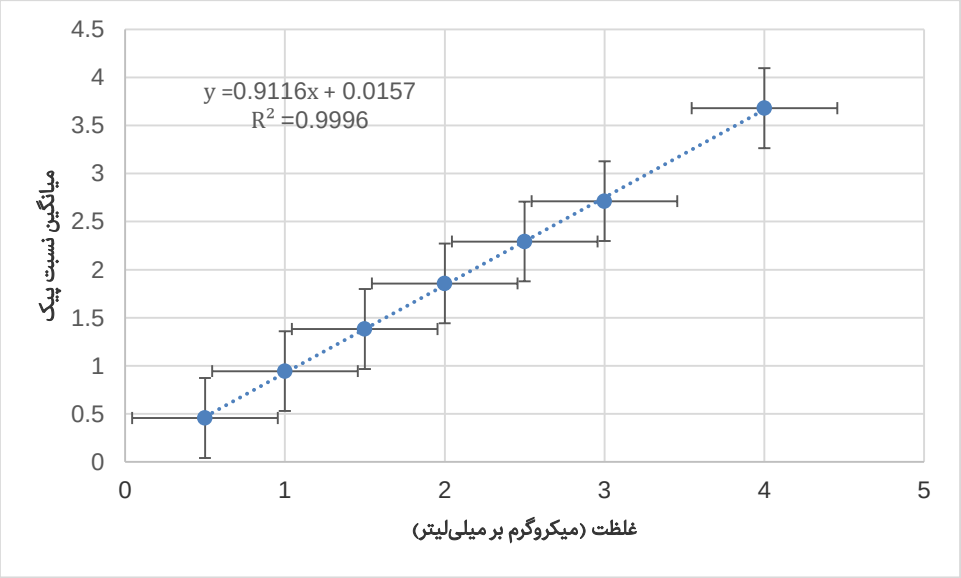

Figure 3. The chlorpyrifos calibration curve for urine sample

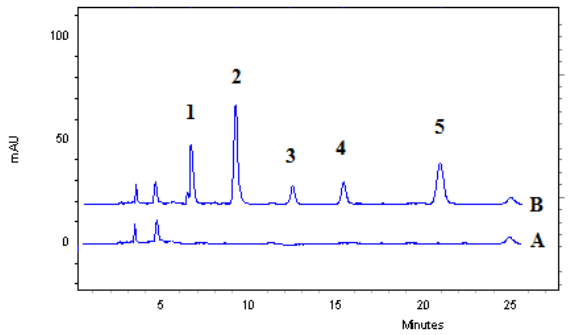

Figure 4. Chromatogram of the selectivity of chlorpyrifos in urine sample
A: Urine chromatogram without sample; B: Chromatogram with injected sample 1-Tramadol, 2-azinephosphate, 3-diazinone, 4-pyrimiphosmethyl, 5-chlorpyrifos