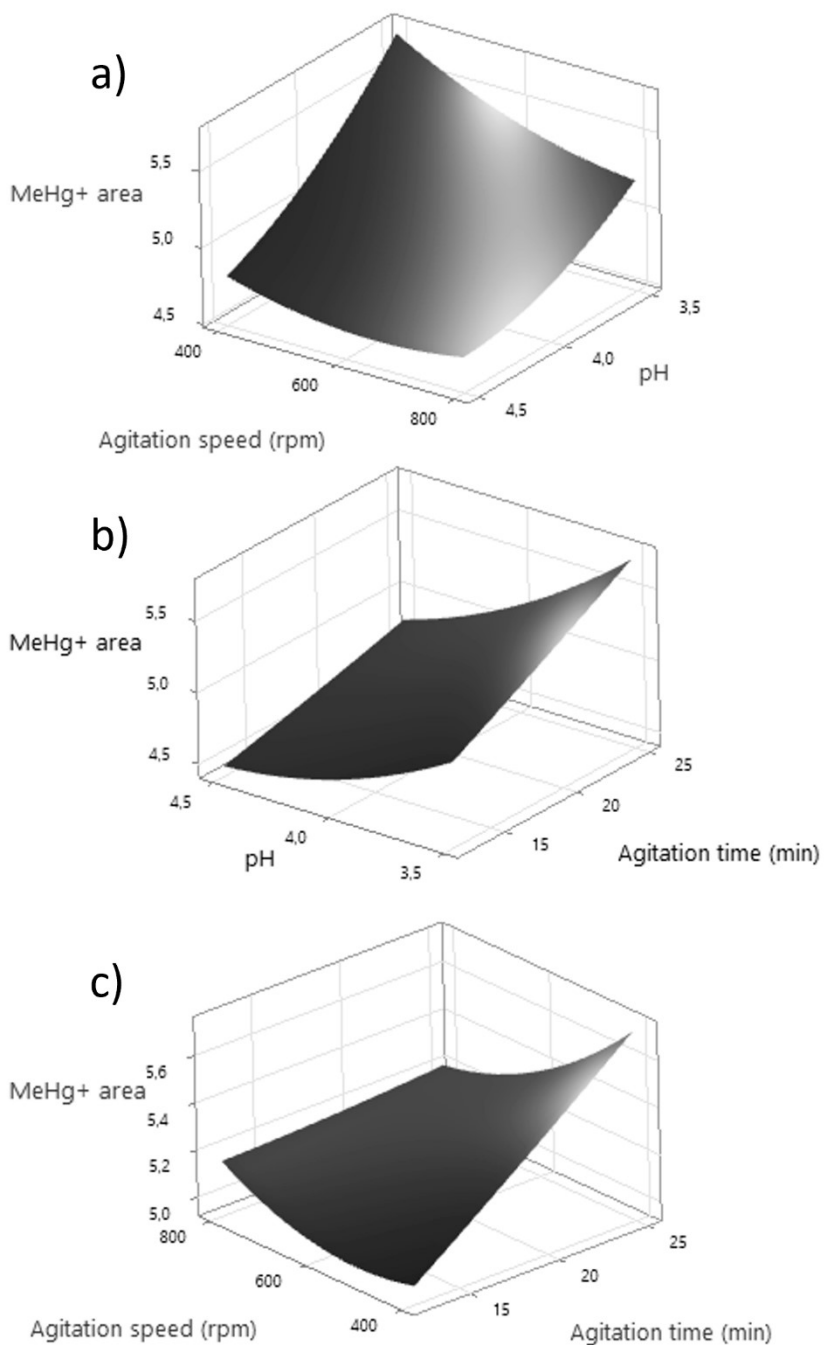
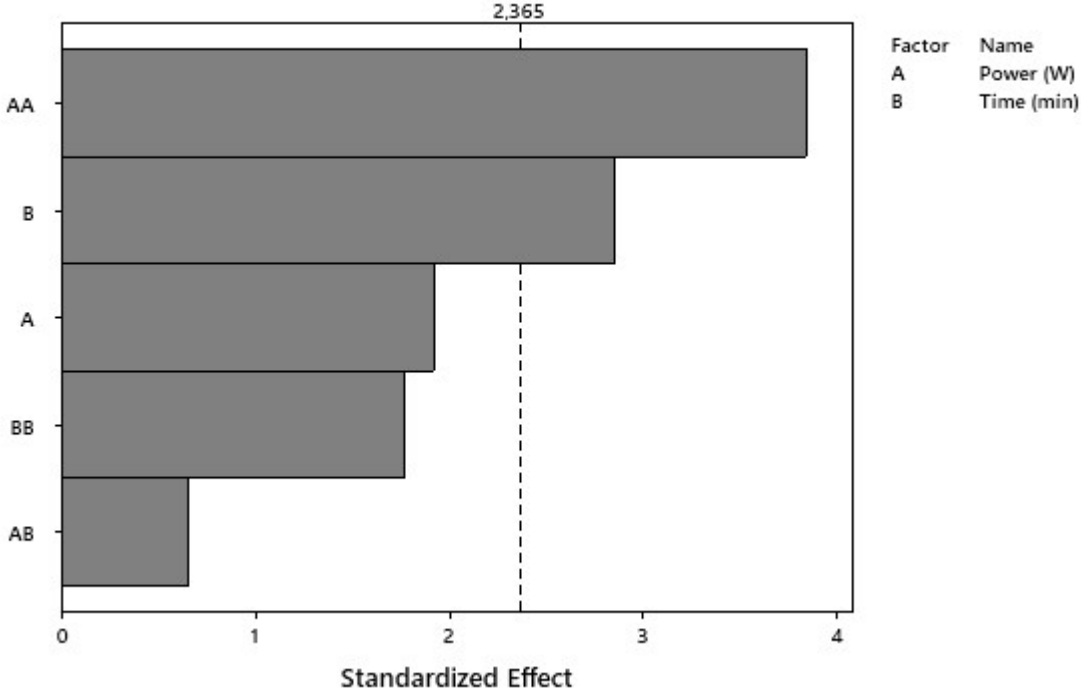


### SUPPLEMENTARY MATERIAL

S.Fig 1. Surface plot of MeHg<sup>+</sup> area obtained through the optimization Box Behnken model for the derivatization and LPME process. Hold values of a) Agitation time (25 min) b) Agitation speed (400 rpm) and c) pH (3,5).



S.Fig 2. Pareto Chart of the variables considered in the Composite central design to the optimization of MAE process ( $\alpha = 0.05$ ). Positive effect: gray bars. Negative effect: white bars.



S.Table 1. Plackett Burman experimental design for the screening of Derivatization and LPME process.

Agitation time (min)	Deriv. agent (%)	pH	Buffer concentration (M)	Temperature (°C)	Agitation speed (rpm)	Solvent	Area
20,0	0,1	5,0	1,0	20,0	700	CH <sub>2</sub> Cl <sub>2</sub>	6,0580
5,0	0,3	5,0	0,4	35,0	100	CH <sub>2</sub> Cl <sub>2</sub>	5,8032
12,5	0,2	4,5	0,7	27,5	400	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	7,4339
5,0	0,3	4,0	0,4	20,0	700	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	8,7979
20,0	0,3	5,0	0,4	35,0	700	CH <sub>2</sub> Cl <sub>2</sub>	7,8264
12,5	0,2	4,5	0,7	27,5	400	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	7,1129
12,5	0,2	4,5	0,7	27,5	400	CH <sub>2</sub> Cl <sub>2</sub>	6,8070
20,0	0,1	5,0	0,4	20,0	100	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	7,4550
5,0	0,1	4,0	1,0	35,0	700	CH <sub>2</sub> Cl <sub>2</sub>	7,2234
12,5	0,2	4,5	0,7	27,5	400	CH <sub>2</sub> Cl <sub>2</sub>	6,3805
20,0	0,3	4,0	1,0	20,0	100	CH <sub>2</sub> Cl <sub>2</sub>	7,2258
5,0	0,3	5,0	1,0	20,0	700	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	7,3768
20,0	0,3	4,0	1,0	35,0	100	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	8,0789
5,0	0,1	5,0	1,0	35,0	100	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	7,3751
20,0	0,1	4,0	0,4	35,0	700	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	8,4888
12,5	0,2	4,5	0,7	27,5	400	CH <sub>2</sub> Cl <sub>2</sub>	6,3082
5,0	0,1	4,0	0,4	20,0	100	CH <sub>2</sub> Cl <sub>2</sub>	6,5696
12,5	0,2	4,5	0,7	27,5	400	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	6,6906

S.Table 2. Box Behnken experimental design for the screening of Derivatization and LPME process.

Agitation time (min)	pH	Agitation speed (rpm)	Area
18,8	3,5	800	5,1874
12,5	4,5	600	4,7809
12,5	3,5	600	4,9264
25,0	4,5	600	4,7140
18,8	3,5	400	5,5007
25,0	4,0	400	5,1155
12,5	4,0	400	4,5328
18,8	4,0	600	4,8193
25,0	4,0	800	4,9424
18,8	4,0	600	4,8566
18,8	4,0	600	4,7699
18,8	4,0	600	4,6437
18,8	4,5	800	4,7286
18,8	4,5	400	4,6138
12,5	4,0	800	5,0304
18,8	4,0	600	4,9107
25,0	3,5	600	5,2532
18,8	4,0	600	4,8001

S.Table 3. Central composite experimental design for the MAE process.

Power (W)	Time (min)	Area
85,36	4	4,8969
25	6	4,8126
50	4	4,2724
75	6	5,0135
50	1,17	4,2066
50	4	4,2720
14,65	4	4,4034
50	4	4,3505
50	4	4,4074
25	2	4,5271
50	4	4,0598
50	6,83	4,5810
75	2	4,5138