

**Supplementary data to:**

**Application of response surface methodology for silver nano-particle stir bar sorptive extraction of heavy metals from drinking water samples: a Box-Behnken design**

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**Table SII.** Design matrix in the Box-Behnken model for the preconcentration of SNPSB

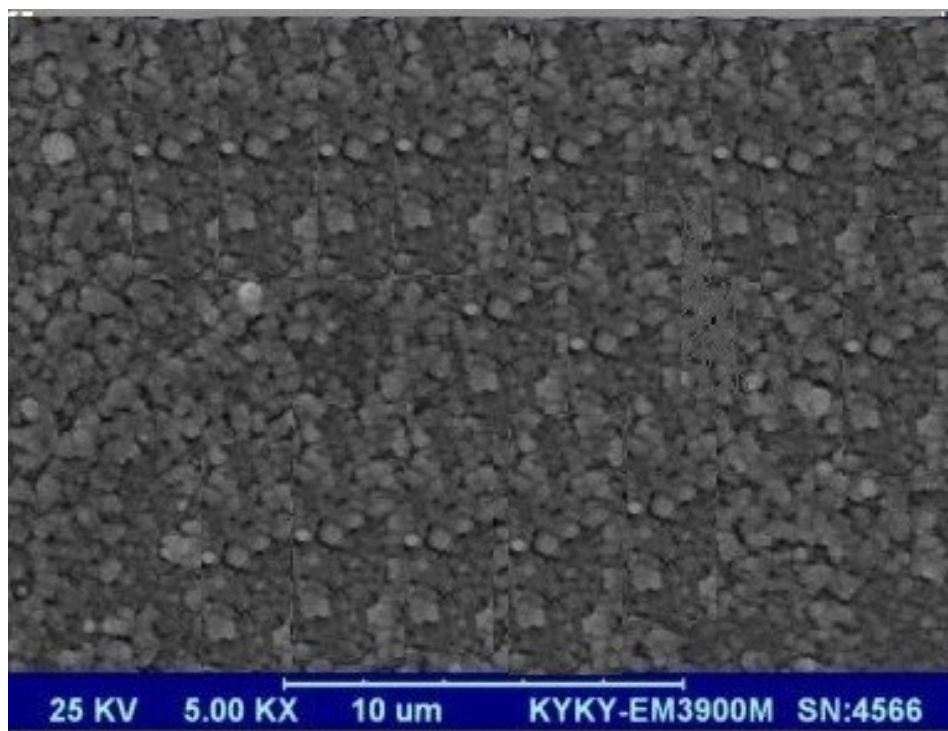
A	B	C	D	E	F	Peak area	Peak area	Peak area	Peak area	Observed R <sub>m</sub>	Predicted R <sub>m</sub>	Error	Percent
3	0.06	0.4	10	20	15	47533	53913	39112	24876	0.79	0.7018	0.089	11.285
3	0.06	0.4	20	20	15	60973	66745	39473	28945	0.93	0.8986	0.029	3.094
3	0.08	0.2	15	20	10	56175	66541	15822	25102	0.76	0.6573	0.100	13.195
3	0.08	0.2	15	20	20	66307	72117	8724	32196	0.78	0.8028	0.038	4.558
3	0.08	0.4	10	15	15	48541	56385	41105	27132	0.83	0.8109	0.022	2.656
3	0.08	0.4	10	25	15	63611	71148	10060	27219	0.85	0.8652	-0.073	-9.208
3	0.08	0.4	20	15	15	48854	55960	40843	27219	0.83	0.8780	-0.046	-5.519
3	0.08	0.4	20	25	15	67440	84500	61335	43305	1.25	1.1834	0.065	5.214
3	0.08	0.6	15	20	10	69168	84935	62488	44817	1.27	1.4244	-0.149	-11.700
3	0.08	0.6	15	20	20	69821	86179	64308	43219	1.28	1.4323	-0.154	-12.051
3	0.1	0.4	10	20	15	72148	78203	51674	34273	1.12	1.0340	0.085	7.632
3	0.1	0.4	20	20	15	76261	82405	52662	36144	1.17	1.2169	-0.045	-3.852
4	0.06	0.2	15	15	15	105733	123940	94109	60020	1.85	2.0688	-0.219	-11.866
4	0.06	0.2	15	25	15	117742	159837	99543	65617	2.10	2.3103	-0.205	-9.754
4	0.06	0.4	15	15	10	110298	122522	96384	60822	1.88	1.7264	0.153	8.164
4	0.06	0.4	15	15	20	134472	169700	119056	73654	2.37	2.1489	0.223	9.405
4	0.06	0.4	15	25	10	130354	145645	101618	64545	2.10	2.2663	-0.164	-7.810
4	0.06	0.4	15	25	20	123386	138893	103816	72305	2.12	2.0435	0.082	3.848
4	0.06	0.6	15	15	15	134788	171023	116833	74081	2.37	2.5447	-0.174	-7.344
4	0.06	0.6	15	25	15	183222	213673	140819	92819	3.00	2.7876	0.208	6.951
4	0.08	0.2	10	20	10	101686	110340	77540	53534	1.64	1.6531	-0.008	-0.470
4	0.08	0.2	10	20	20	109386	117310	90807	56931	1.80	1.9293	-0.133	-7.397
4	0.08	0.2	20	20	10	104663	117238	86929	53441	1.73	1.6348	0.094	5.461
4	0.08	0.2	20	20	20	129898	144173	96359	65684	2.08	2.0843	-0.006	-0.307
4	0.08	0.4	15	20	15	240286	229984	199362	111543	3.73	3.6568	0.072	1.929
4	0.08	0.4	15	20	15	246224	265842	186743	100461	3.73	3.6568	0.074	1.993
4	0.08	0.4	15	20	15	201483	248712	176548	95231	3.40	3.6568	-0.259	-7.617
4	0.08	0.4	15	20	15	211269	211269	196346	120111	3.60	3.6568	-0.055	-1.532
4	0.08	0.4	15	20	15	232171	265842	191011	112473	3.80	3.6568	0.141	3.715
4	0.08	0.4	15	20	15	257002	257002	180574	98451	3.69	3.6568	0.035	0.958
4	0.08	0.6	10	20	10	183526	71706	65012	39163	1.64	1.6955	-0.060	-3.640
4	0.08	0.6	10	20	20	193757	86030	66383	39929	1.74	1.7763	-0.033	-1.913
4	0.08	0.6	20	20	10	199410	93656.4	60621	49400	1.84	1.7744	0.069	3.751
4	0.08	0.6	20	20	20	177590	129043	94978	55273	2.11	2.0293	0.084	3.961
4	0.1	0.2	15	15	15	154634	172305	112765	77673	2.46	2.5794	-0.117	-4.761
4	0.1	0.2	15	25	15	164066	166178	124900	73046	2.89	2.7824	-0.284	-11.378
4	0.1	0.4	15	15	10	101495	101850	65798	44601	1.48	1.6062	-0.127	-8.570
4	0.1	0.4	15	15	20	151827	157950	127096	77673	2.47	2.3691	0.100	4.050
4	0.1	0.4	15	25	10	238586	80046	55955	50291	1.93	2.0697	-0.141	-7.305
4	0.1	0.4	15	25	20	127586	148896	98758	65544	2.10	2.1974	-0.100	-4.759
4	0.1	0.6	15	15	15	120004	168469	126113	80024	2.40	2.1149	0.285	11.861
4	0.1	0.6	15	25	15	106025	173253	133523	85555	2.44	2.2728	0.174	7.092
5	0.06	0.4	10	20	15	110205	109587	104656	63694	1.90	1.9339	-0.038	-1.985
5	0.06	0.4	20	20	15	128096	101181	104503	62545	1.92	1.9383	-0.014	-0.744
5	0.08	0.2	15	20	10	156461	107936	106240	75208	2.17	2.0497	0.124	5.713
5	0.08	0.2	15	20	20	158871	206723	153169	92833	2.94	2.6402	0.297	10.104
5	0.08	0.4	10	15	15	120695	119656	70963	55041	1.73	1.7202	0.014	0.791
5	0.08	0.4	10	25	15	116108	102882	93252	65681	1.85	1.6980	0.155	8.383
5	0.08	0.4	20	15	15	183181	18604	66914	45228	1.49	1.5535	-0.059	-3.919
5	0.08	0.4	20	25	15	161888	76806	81554	47534	1.72	1.8340	-0.110	-6.402
5	0.08	0.6	15	20	10	102373	86982	60715	41672	1.38	1.2987	0.078	5.690
5	0.08	0.6	15	20	20	110347	95261	49624	43350	1.40	1.5896	-0.192	-13.744
5	0.1	0.4	10	20	15	117818	73103	72887	40696	1.44	1.5596	-0.122	-8.466
5	0.1	0.4	20	20	15	162186	79628	51897	35534	1.49	1.5212	-0.034	-2.316

**Table SI2.** ANOVA for preconcentration of heavy metals

Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F	PC%
Model	2.15	27	0.079	37.89	< 0.0001	
A	0.34	1	0.34	160.21	< 0.0001	15.78
B	$3.14 \times 10^{-5}$	1	$3.14 \times 10^{-5}$	0.015	0.90	$3.14 \times 10^{-5}$
C	$6.12 \times 10^{-6}$	1	$6.12 \times 10^{-6}$	0.0029	0.96	$6.12 \times 10^{-6}$
D	0.0055	1	0.0055	2.63	0.12	0.25
E	0.014	1	0.014	6.65	0.016	0.65
F	0.029	1	0.029	14.02	0.0009	1.35
AB	0.024	1	0.024	11.47	0.0023	1.11
AC	0.11	1	0.11	51.73	< 0.0001	5.10
AD	0.0050	1	0.0050	2.37	0.14	0.23
AE	0.00033	1	0.00033	0.15	0.70	0.015
AF	0.0035	1	0.0035	1.66	0.21	0.16
BC	0.024	1	0.024	11.55	0.0022	1.11
BD	$7.33 \times 10^{-5}$	1	$7.33 \times 10^{-5}$	0.035	0.85	$7.33 \times 10^{-5}$
BE	0.00021	1	0.00021	0.10	0.75	0.0097
BF	0.0037	1	0.0037	1.74	0.20	0.17
CD	0.00035	1	0.00035	0.17	0.69	0.016
CE	$1.64 \times 10^{-5}$	1	$1.64 \times 10^{-5}$	0.0078	0.93	$1.64 \times 10^{-5}$
CF	0.0027	1	0.0027	1.29	0.27	0.12
DE	0.0034	1	0.0034	1.64	0.21	0.16
DF	0.00098	1	0.00098	0.47	0.50	0.045
EF	0.013	1	0.013	6.34	0.018	0.60
A <sup>2</sup>	0.80	1	0.80	383.66	< 0.0001	37.13
B <sup>2</sup>	0.076	1	0.076	36.37	< 0.0001	3.53
C <sup>2</sup>	0.046	1	0.046	21.97	< 0.0001	2.13
D <sup>2</sup>	0.31	1	0.31	146.33	< 0.0001	14.39
E <sup>2</sup>	0.093	1	0.093	44.33	< 0.0001	4.32
F <sup>2</sup>	0.25	1	0.25	121.70	< 0.0001	11.60
Residual	0.054	26	0.0021			
Lack of Fit	0.051	21	0.0024	3.69	0.076	
Pure Error	0.0033	5	0.00066			
Cor Total	2.20	53				



**Fig. S11.** Photo of silver nano-particle stir bar.



**Fig. S12.** SEM image of SNPSB after 60 extractions.