Electronic Supplementary Material (ESI) for RSC Advances

Process optimization for the synthesis of functionalized Au@AgNPs for specific detection of Hg^{2+} based on quality by design (QbD)

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Table S 1 Coded and uncoded values of Plackeet-Burman factors

CPPs		Code value	
		-1	1
trisodium citrate dosage（μL）	X_1	400	600
gold nanosynthesis time（min）	X_2	5	10
ascorbic acid dosage（μL）	X_3	150	200
silver nitrate dosage（μL）	X_4	150	200
oscillation time（min）	X_5	10	15
incubation time（min）	X_6	3	5

Table S2 Box-Behnken design experiment and results

	Critical process parameters **(CPPs)**			Critical quality attributes **(CQAs)**
Number	X_1	X_2	X_4	R
1	500	7.5	175	42655
2	500	7.5	175	44433
3	500	7.5	175	43149
4	500	7.5	175	41501
5	500	7.5	175	44603
6	500	10	150	40413
7	500	10	200	32942
8	500	5.0	150	40701
9	500	5.0	200	37883
10	400	5.0	175	16391

11	400	7.5	175	17567
12	400	7.5	200	10990
13	400	10	175	14444
14	600	5.0	175	35840
15	600	7.5	150	41382
16	600	7.5	200	27133
17	600	10	175	40063

Table S3 Regressiom equation

	Regression equation model
Final Equation in Terms of Coded Factors:	R1=-6.79X_5 + 005 + 1568X_1 + 7189X_2 + 3203X_3 - 2.9X_1X_2 + 0.11X_1X_3 - 1.98X_2X_3 - 1.42X_1^2 - 400X_2^2 - 9.5X_3^2