Electronic Supplementary Information (ESI) for

Highly Effective and Specific Way for Trace Analysis of Carbaryl Insecticides Based on $Au_{42}Rh_{58}$ Alloy Nanocrystals

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Supplementary Materials

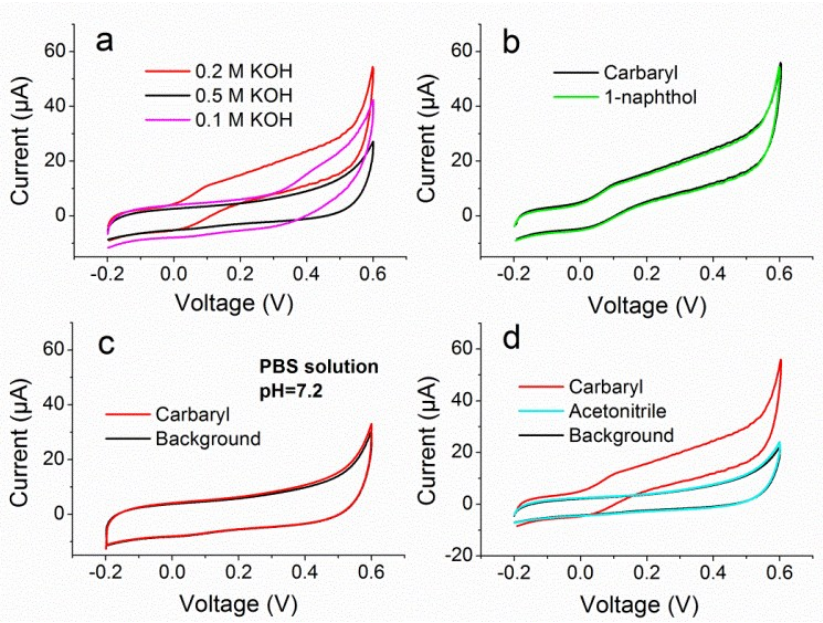

Fig. S1 Different CV measurements over $Au_{42}Rh_{58}$ nanocrystals. (a) Carbaryl (500 nM) in different concentration of KOH, (b) same concentration of carbaryl and 1-naphthol, (c) carbaryl (500 nM) in PBS solution (pH=7.2), (d) carbaryl (500 nM) and acetonitrile (0.038 M) in 0.2 M KOH.

Table S1 Sensing performance for the detection of carbaryl in recent publications.

Materials	Techniques	LOD[a]	Anti- Interference Capability		Ref.
			Towards existing substances	Towards OP Pesticides	
Au NPs[b]	SERS[c]	1 ppm (~5 μM)	-	-	[1]
-	Visible spectrophotometric analysis	0.1 mg/kg (~0.5 μM)	-	-	[2]
MWCNT[d] based bi-enzyme	Electrochemical sensor	1 μM	-	×	[3]
RB[e]-Au NPs	Colorimetric and fluorometric assay	0.1 μg/L (~0.5 nM)	-	×	[4]
AChE-AuNPs/MPS[f] /Au	Electrochemical sensor	1 nM	Nitrophenol, AA[g], UA[h], metal ions, $SO_4^{2-}$and NO_3^-	-	[5]
-	HFF[i] QCM[j] immunosensor	0.14 μg/L (~0.7 nM)	-	×	[6]
$Au_{42}Rh_{58}$ alloy nanocrystals	Electrochemical sensor	1 nM	Glucide, amino acids, and metal ions	√	This work

[a] Limit of detection
[b] Nanoparticles
[c] Surface-enhanced Raman scattering
[d] Multi-walled carbon nanotube
[e] 3-Mercaptopropyl)-trimethoxysilane
[f] Ascorbic acid
[g] Uric acid
[h] Rhodamine B
[i] High fundamental frequency
[j] Quartz crystal microbalance

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