

Supplementary file

RSC Advances

Title: Fabrication of a new modified gold electrode based on gold nanoparticles and nanomagnetic Fe₃O₄/SiO₂-(CH₂)₃-SH core shell for electrochemical evaluation and determination of dinitramine herbicide in water

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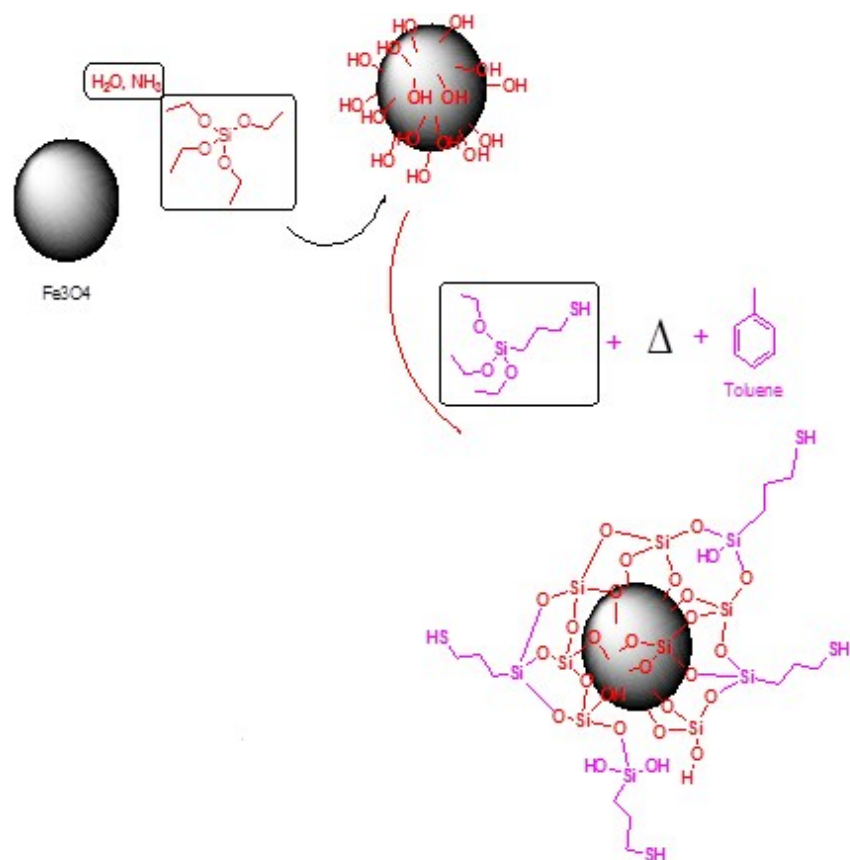
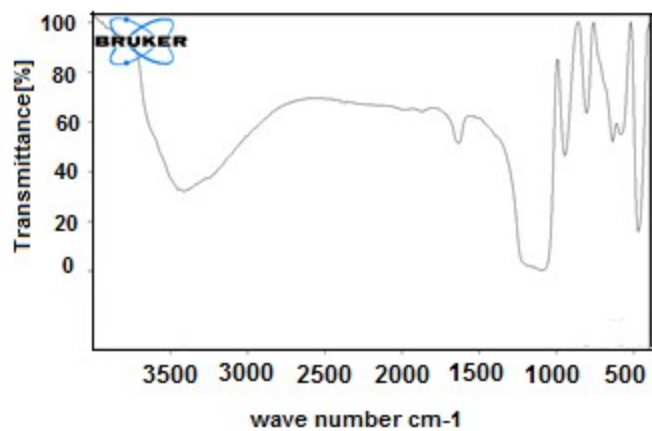
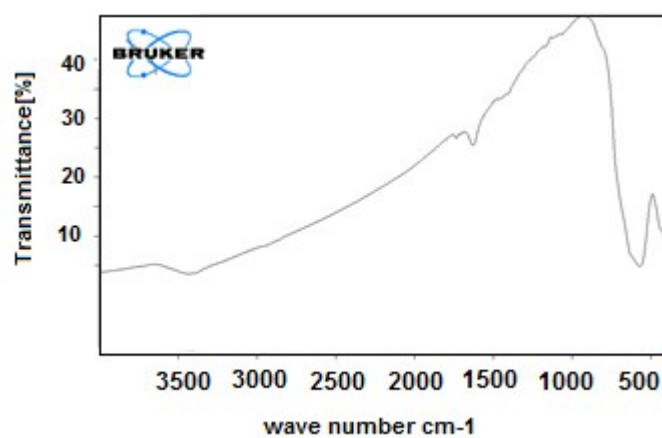


Fig.S1. Synthesis of Fe₃O₄/SiO₂-Si-(CH₂)₃-SH core shell from Fe₃O₄ nanoparticles

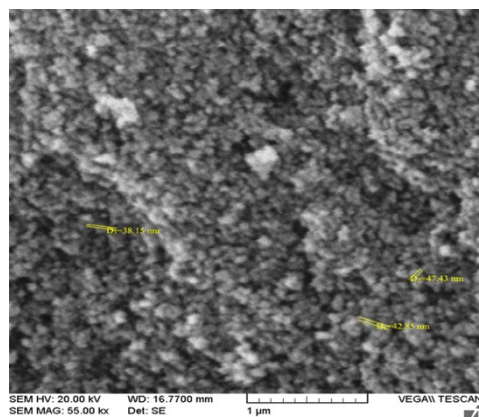


(a)

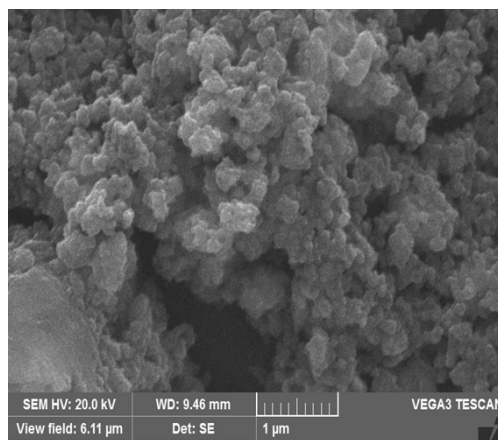


(b)

Fig.S2. FT-IR spectrum of magnetite nanoparticles ($\text{Fe}_3\text{O}_4/\text{SiO}_2$) (a) and magnetite nanoparticles coated with mercapto groups ($\text{Fe}_3\text{O}_4/\text{SiO}_2\text{-Si-(CH}_2\text{)}_3\text{-SH}$) (b)

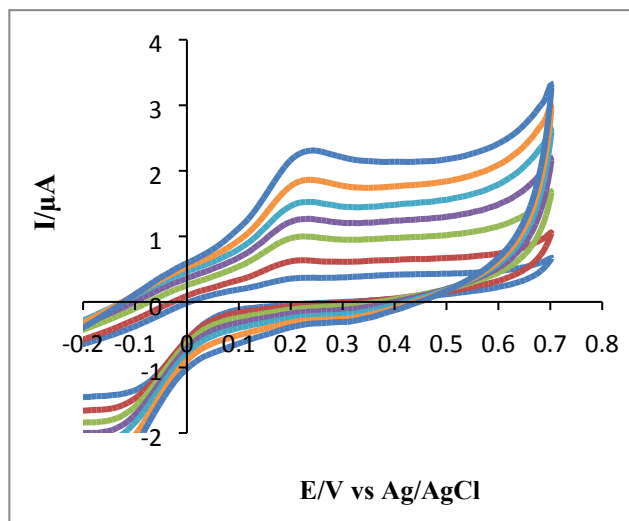


(a)

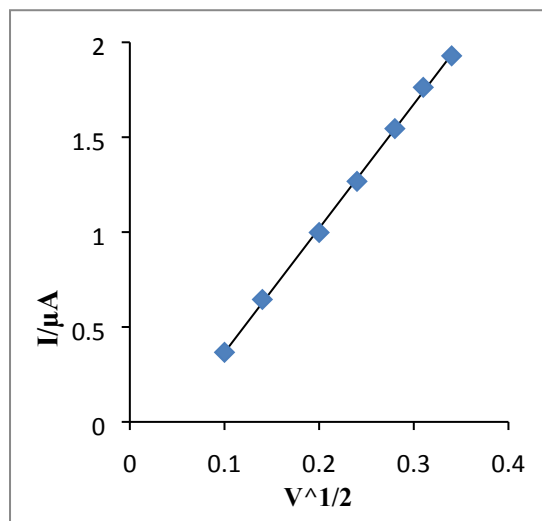


(b)

Fig.S3. SEM of the magnetite nanoparticles coated with silanol groups ($\text{Fe}_3\text{O}_4/\text{SiO}_2$) (a) and magnetite nanoparticles coated with mercapto groups ($\text{Fe}_3\text{O}_4/\text{SiO}_2\text{-Si}(\text{CH}_2)_3\text{-SH}$) (b).



(a)



(b)

Fig.S4. CVs for dinitramine at the modified Au/Au-NPs -S-(CH_2)₃-Si -SiO₂/Fe₃O₄ electrode in B-R buffer (0.04 molL⁻¹, pH= 7.0) containing of 1 x10⁻⁵ molL⁻¹ dinitramine, at different scan rates from 0.01 to 0.12 mV s⁻¹(a), linear curve for I_p versus $V^{1/2}$ at about 0.20V (b).

TableS1. The interferences of foreign ions and pesticides on the determination of dinitramine at the level of $1.0 \times 10^{-6} \text{ molL}^{-1}$

Foreign ions	Added as	Tolerance limits (fold)
Trifluralin		200
2methyl,4,6dinitropheol		230
Pb ²⁺	Pb(NO ₃) ₂	1000
Al ³⁺	AlCl ₃	1000
Fe ³⁺	FeCl ₃	1000
Br ⁻	NaBr	950
I ⁻	NaI	950
NO ₃ ⁻	NaNO ₃	950
CO ₃ ²⁻	CaCO ₃	2000
SO ₄ ²⁻	MgSO ₄	1500