Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting Information

A multifunctional nanocatalyst, 9, 10-dibromooctadecanoic acid encapsulated heterostructure ($Ag@Ag_2O$) development for water toxicity

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Element involved	Type of Nanostructure	Water contaminant	Removal %	Literature
α-Fe	Mesoporous nanospherical necklace	As (V), Cr (VI)	100	26
Aluminosilica monoliths	Optical mesocaptor	Cr^{6+}	96-99	27
Mesocage aluminosilica	Optical mesosensor	Multiple metals	N.A	28
SiO_2–FeOOH–Fe	Core–shell	NO^{3-}	99.84	29
ZnO	Core–shell	Malachite green	97.3	30
TiO_2	Core–shell	Methyl orange	60	31

Table.1. Reported nanostructures against various water contaminants with efficiency %.

Surfactant	Method	Reducing agent	Shelf life	Litera-ture
Castor oil	Laser	Laser ablation	2 months	39
Mercapto acetic acid	Chemical	$NaBH_4$	20 days	40
Cysteine	Chemical	Electro-chemically active biofilm	5 days	41
Gum acacea	Radiolysis	Gamma rays	5 months	42
Poly saccharide	Green	Carboxy methyl tamarind	6 months	43
Protein	Green	Fungal proteins	3 months	44

Table.2. Reported capped silver nanoparticles with respective shelf life.

Nano-catalysts	Conta-minants	Pseudo first order kinetics	
		Rate constant (sec^{-1})	R
OANP	MO	$1.3*10^{-4}$	0.97552
ACSN	MO	$2.05*10^{-3}$	0.86392
OANP	MB	$1.04*10^{-3}$	0.98847
ACSN	MB	$4.24*10^{-3}$	0.9181
OANP	Cr(VI)	$7.11*10^{-4}$	0.94359
ACSN	Cr(VI)	$2.27*10^{-3}$	0.93262

Table.3. The determined kinetic values of reduction of contaminants by various catalysts.

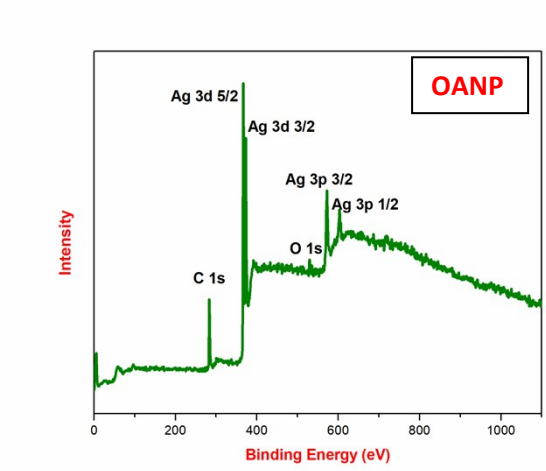

Figure S1. The complete XPS survey of OANP.

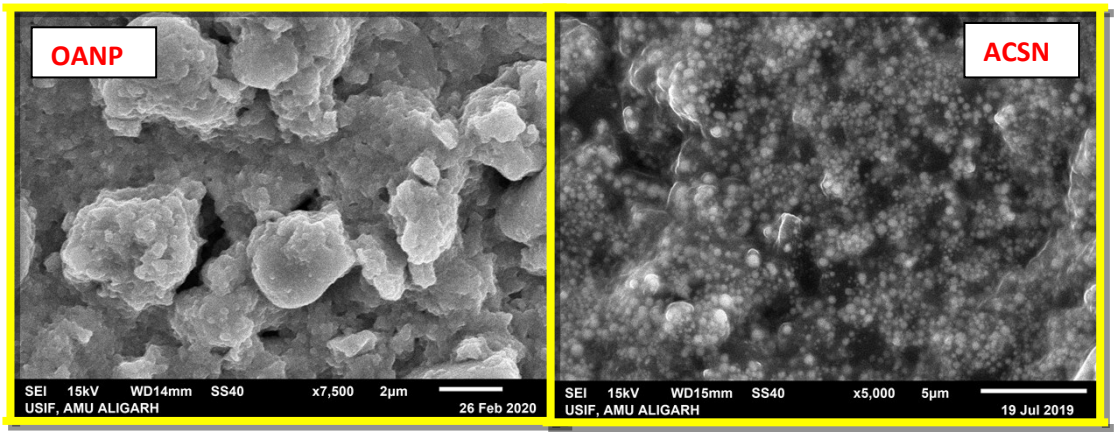

Figure S2. The SEM of OANP and ACSN at different magnification.

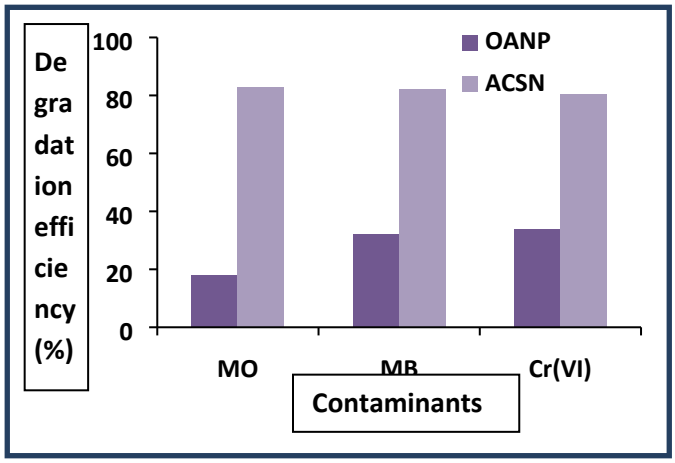

Figure S3. Comparative MO, MB and Cr(VI) degradation efficiency (%) over nanocatalysts with the data reported as mean + SD.