

Gum hydrocolloids reinforced silver nanoparticle sponge for catalytic degradation of water pollutants

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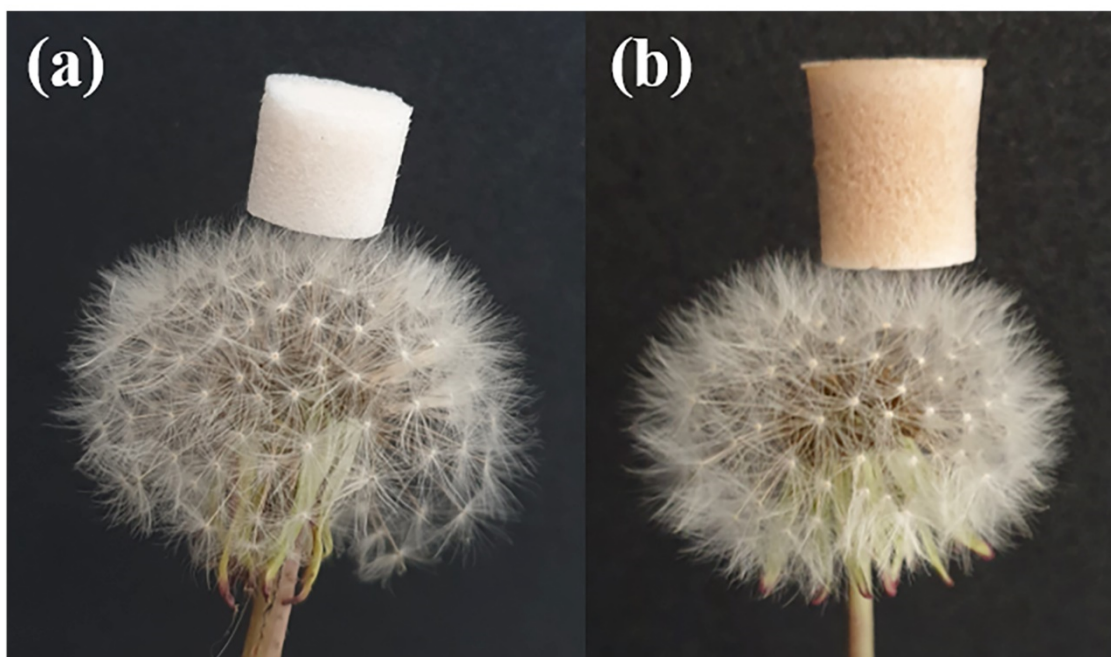


Figure S1. (a) and (b) Digital photograph of KS and Ag@KS sponge respectively on a dandelion flower

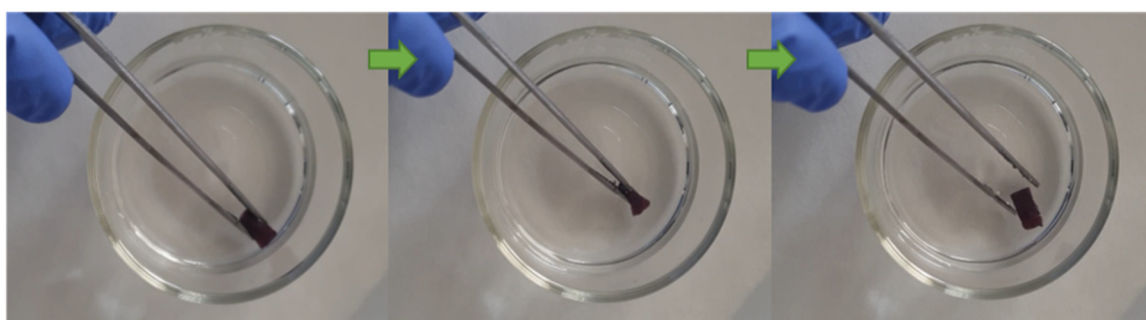


Figure S2. Photographs taken when the hydrated Ag@KS sponge was fully recovered after compressive squeezing.

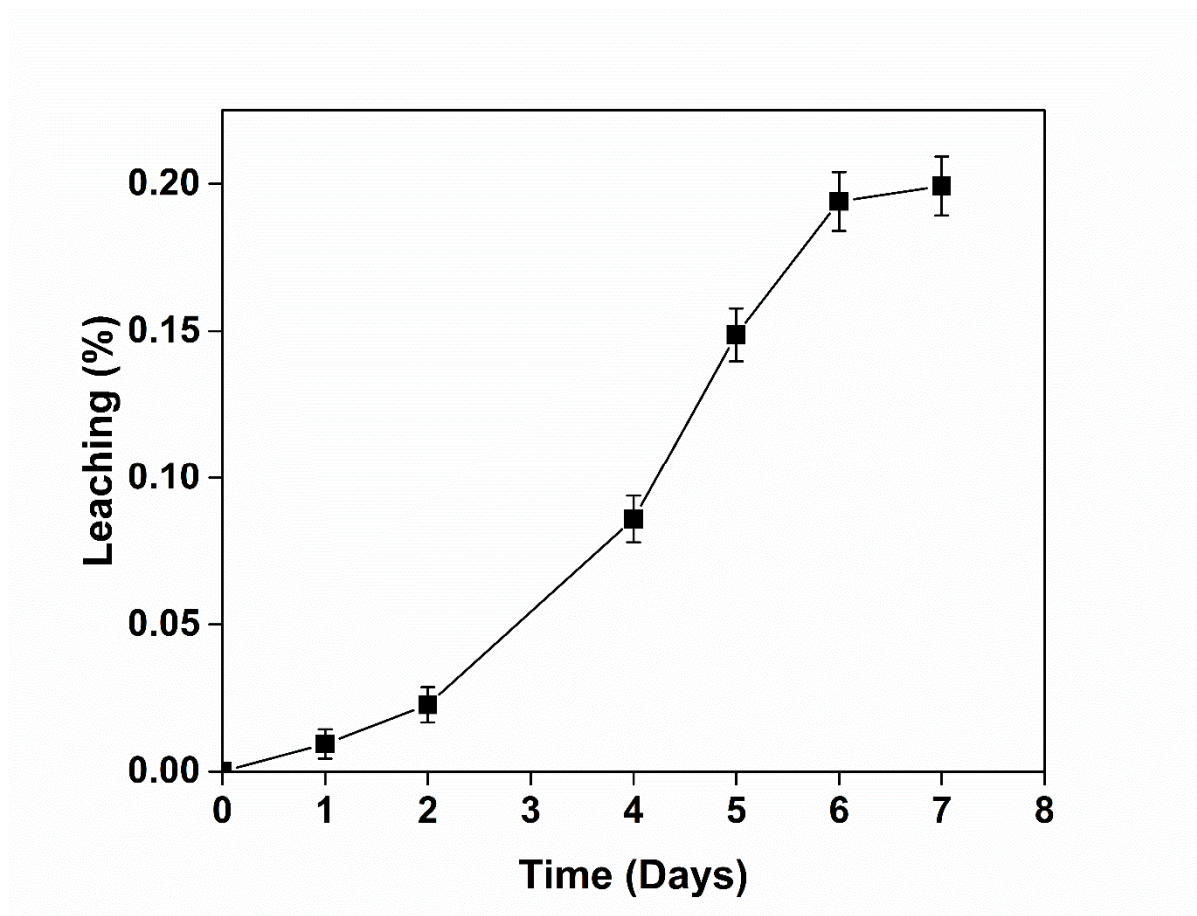


Figure S3. The leaching percentage of AgNPs from Ag@KS sponge, calculated using ICP-MS analysis for 7 days of immersion in water.

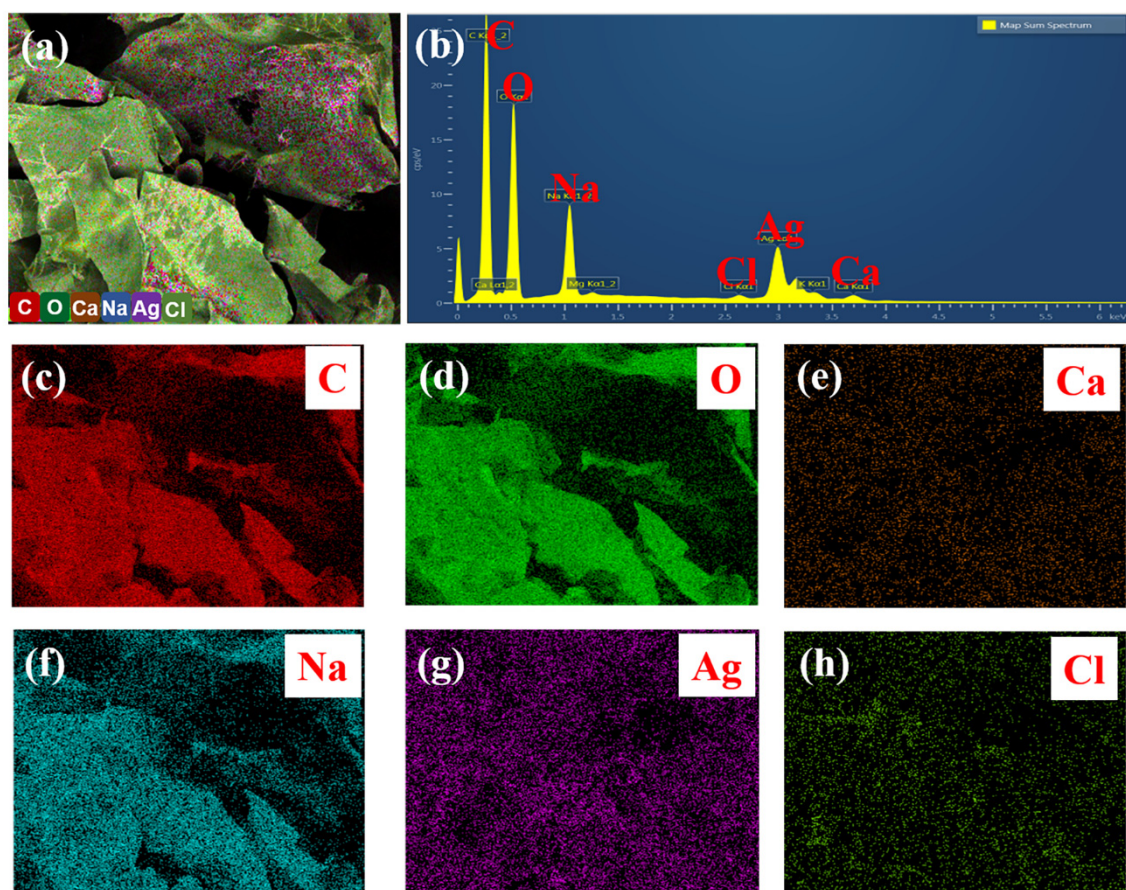


Figure S4. (a) SEM image and (b) Energy-dispersive X-ray spectra of Ag@KS sponge. Elemental distribution of (c) C, (d) O, (e) Ca, (f) Na, (g) Ag, and (h) Cl, respectively.

Table S1. The percentage of AgNPs retained in the sponge at different precursor concentrations, estimated using ICP-MS analysis.

SL. No	Concentration of AgNO ₃ (mM)	Total polymer concentration (%)	Amount of AgNPs present in the sponge (%)
1	4	1.5	97 ± 2
2	6	1.5	96 ± 2
3	8	1.5	94 ± 1
4	10	1.5	90 ± 2

Table S2. Comparison of the catalytic activity of different catalysts for MB catalytic degradation.

Catalyst name	Catalyst amount (mg)	Rate constant (min^{-1})	k_m ($\text{min}^{-1} \text{g}^{-1}$)	Ref.
Copper-agarose-sponge	20	0.5781	29	[1]
Nickel-agarose-sponge	20	0.2733	14	[1]
Iron-graphene sponge	10	0.6	60	[2]
3D-graphene/ gold nanoparticles	30	0.0125	0.4	[3]
Silver-magnetic iron oxide	10	0.34	34	[4]
Ag@KS	3.1	0.116	37	This work

Table S3. Comparison of the catalytic activity of different catalysts for 4-NP catalytic degradation.

Catalyst name	Catalyst amount (mg)	Rate		Ref.
		constant (min ⁻¹)	k_m (min ⁻¹ g ⁻¹)	
Copper-agarose-sponge	20	0.3224	16	[1]
Nickel-agarose-sponge	20	0.1577	8	[1]
Copper sponge	10	0.104	10	[5]
Nickel sponge	10	0.009	1	[5]
AgNPs/graphene-Loofah sponge	76	1.893	25	[6]
Gold NPs/graphene oxide/Tannic acid	18	0.188	10	[7]
Ag@GKS	1	0.044	44	This work

Supplementary references

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