Electronic Supplementary Material (ESI) for Soft Matter.

Swift catalytic reduction of hazardous pollutants by new generation microgels

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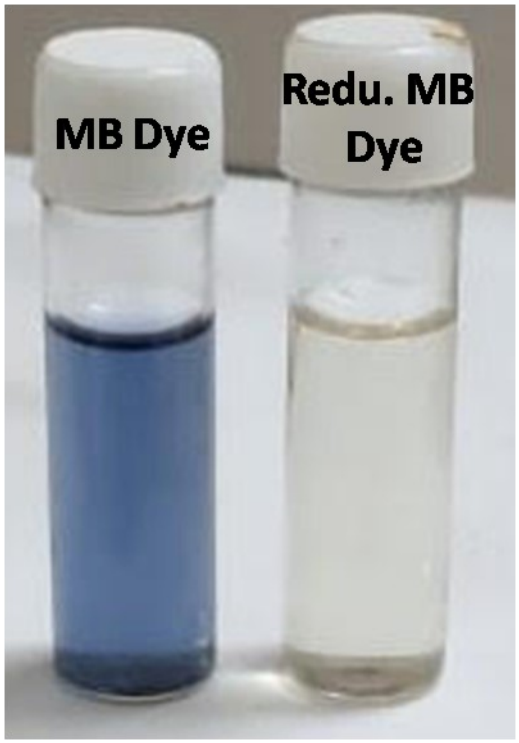
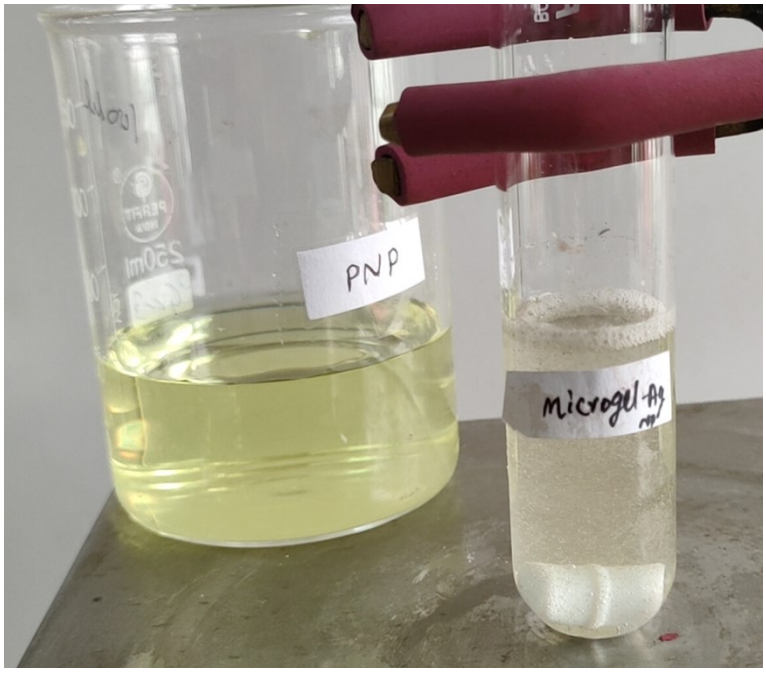
Supplementary Materials



S 1: Methylene blue dye images of before and after catalytic reduction by microgels.



S 2: P-nitro phenol images of before and after catalytic reduction by microgels.

XRD

XRD analysis of G1 and G1_Ag composite was performed by 18 kW Cu-rotating anode RIGAKU Minifex 600 (Tokyo, Japan) and the scattering angle (2θ) was varied from 5 to 70^{o}

In XRD analysis of microgel no crystalline peak was observed, only one hump was depicted at 19.44^{o} (2θ value). So, microgel is amorphous in nature. In composites, the characteristic Ag NPs planes (111), (200), (220) and (311) was observed at 2θ value of 36.27, 48.05, 69.14 and 75.46 respectively. The asterisk marks attributed as undefined peaks. It indicates, the silver nanoparticles were belonging to FCC arrangement and crystalline in nature.[1] The broadening of Bragg's peaks were confirmed that formation and successfully stabilization of NPs in microgel. The average size of silver nanoparticles was calculated by using the Debye–Scherrer's equation:

$$D = 0.94\lambda/\beta\cos\theta$$

Where D is the average crystallite domain size perpendicular to the reflecting planes, λ is the X-ray wavelength, β is the full width at half maximum (FWHM), and θ is the diffraction angle. It is found that the calculated average size is 17.82 nm from FWHM of peaks. XRD graph of microgel and composite is shown in **Fig. S3**.[2]

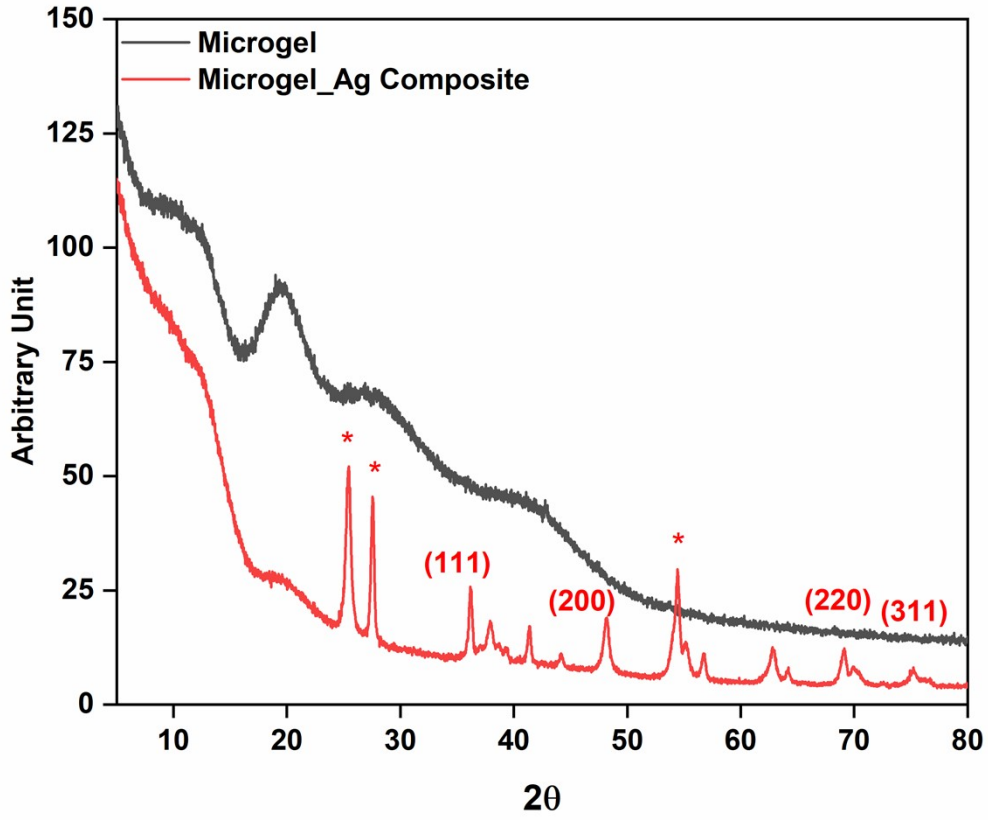


Fig. S 3: XRD graph of microgel and microgel_Ag composite.

References

1. R. Begum, J. Najeeb, G. Ahmad, W. Wu, A. Irfan, A. G. Al-Sehemi and Z. H. Farooqi, *React. Funct. Polym*., 2018, 132, 89-97.
2. T. C. Prathna, N. Chandrasekaran, A. M. Raichur and A. Mukherjee, *Colloids Surf. B: Biointerf.*, 2011, 82(1), 152-159.