

Oxidant- free dehydrogenation of alcohols using chitosan/polyacrylamide entrapped Ag nano particles

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Supporting information

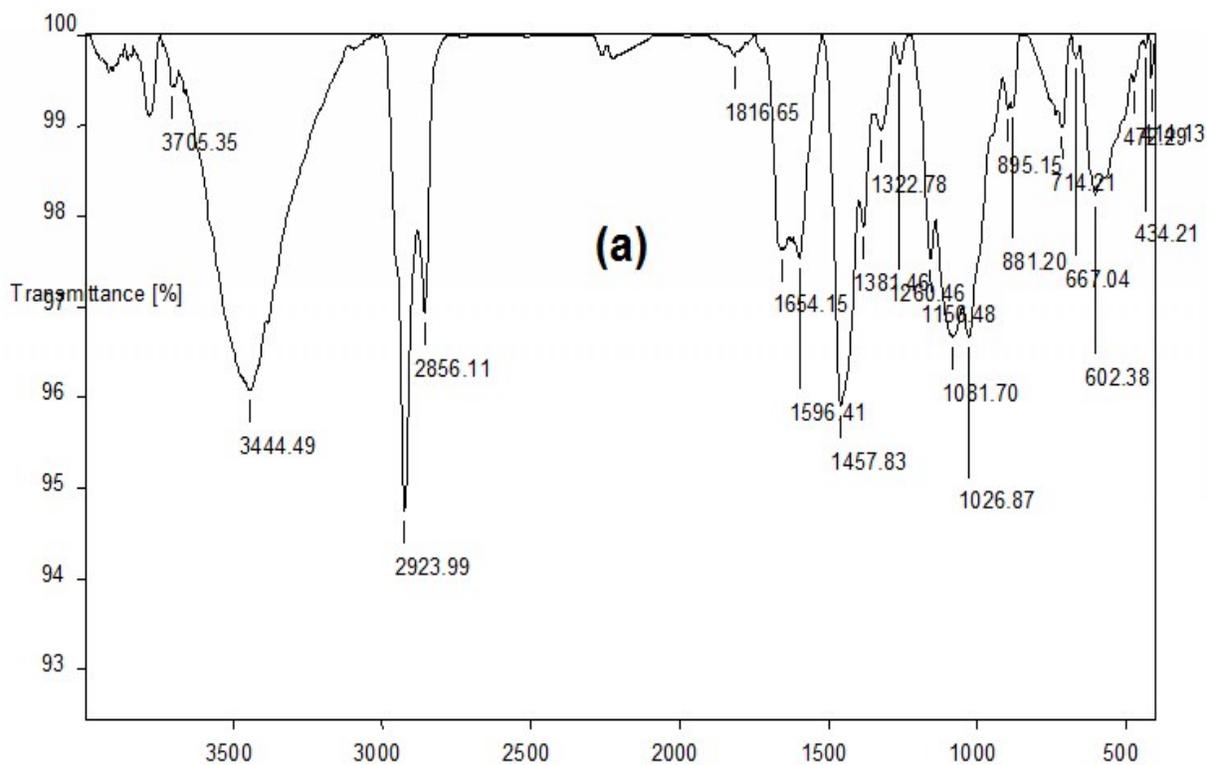


Fig. S1 (a) FTIR spectrum of chitosan

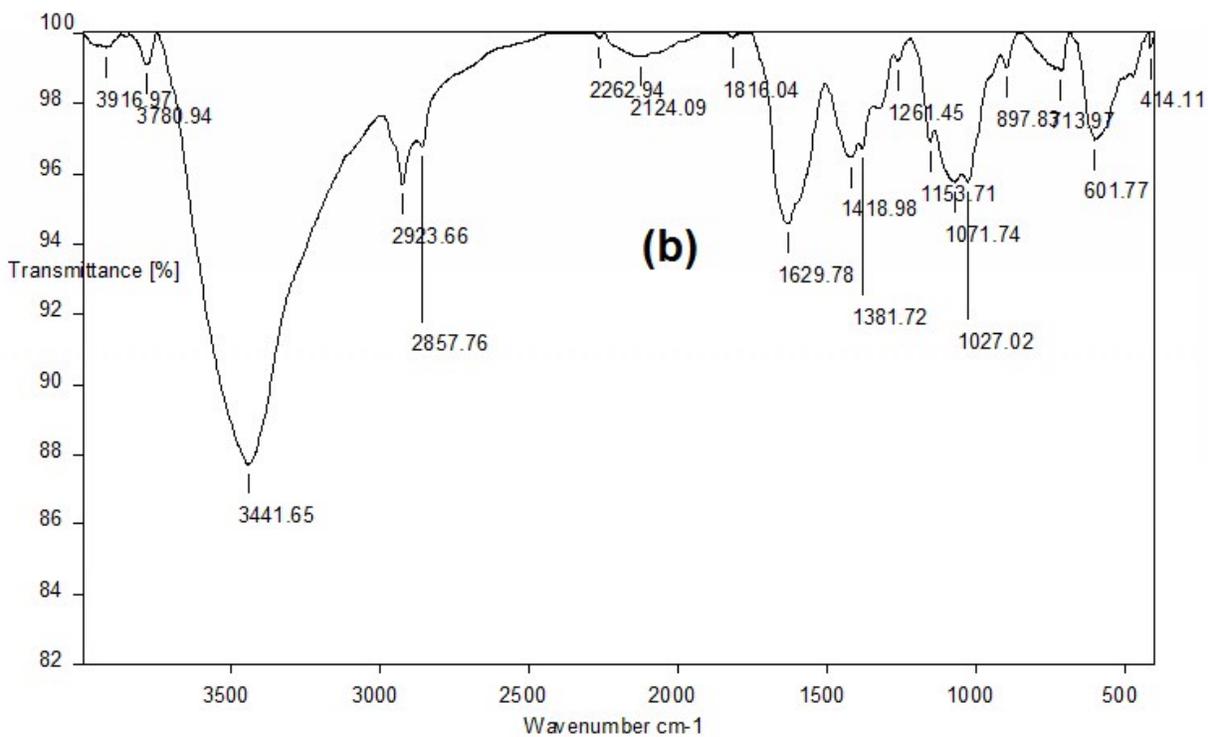


Fig. S1 (b) FTIR spectrum of Ag/chitosan

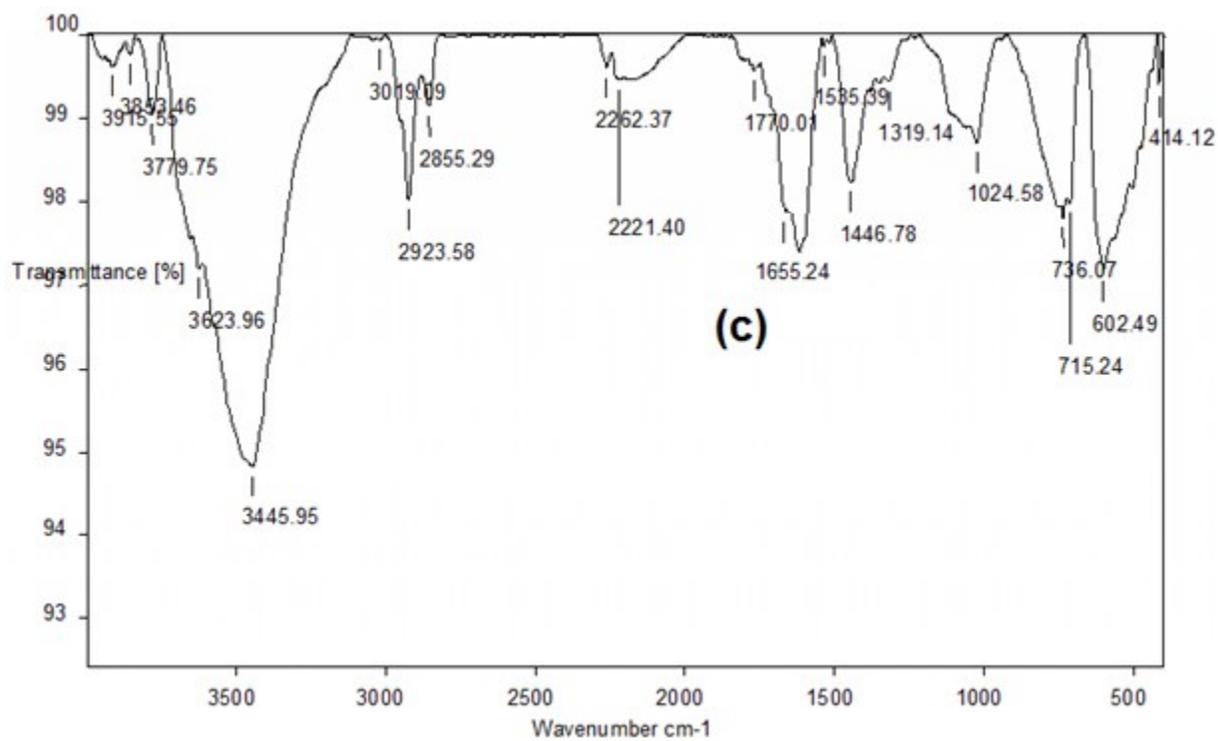


Fig. S1 (C) FTIR spectrum of Ag@IPN

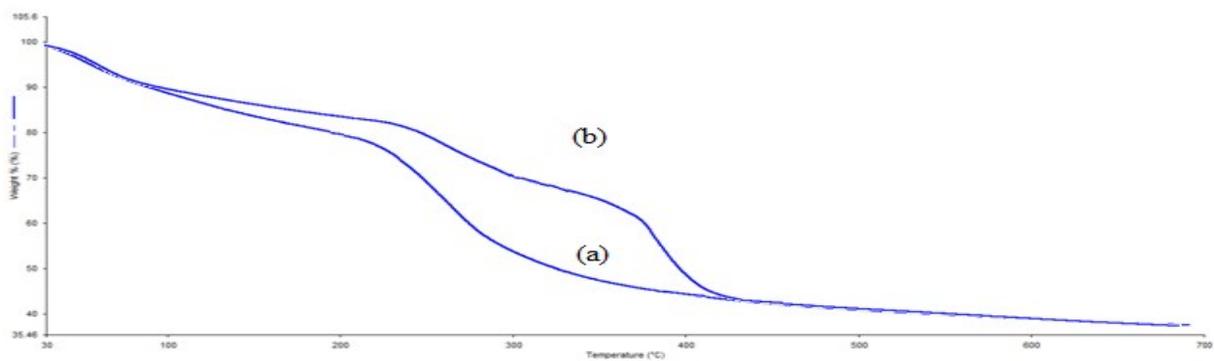


Fig. S2 TGA curves of Ag/chitosan (a) and Ag@IPN (b)

Transmission electron micrographs of silver in chitosan (a&b) and chitosan-polyacrylamide IPN networks (c &d)

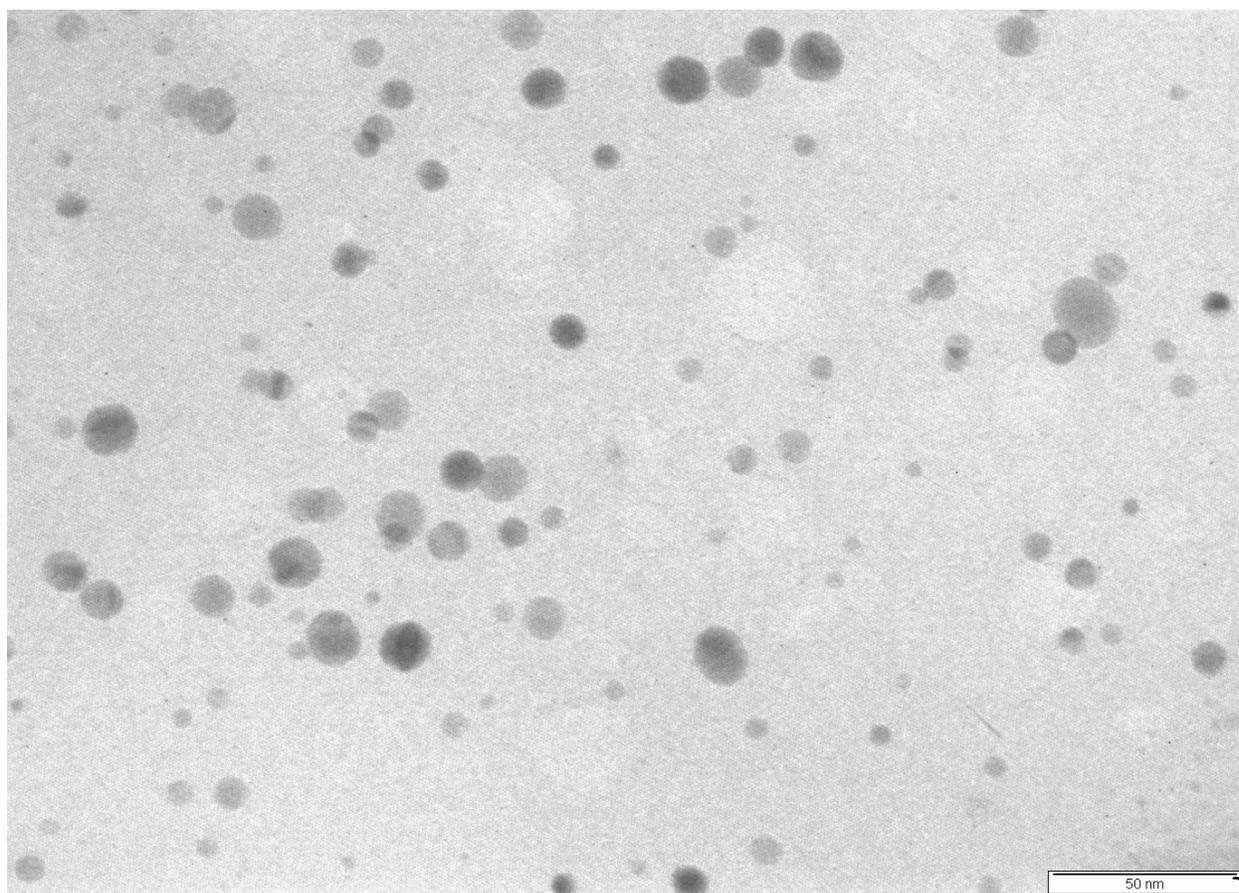


Fig: S3 (a) TEM image of silver particles in chitosan

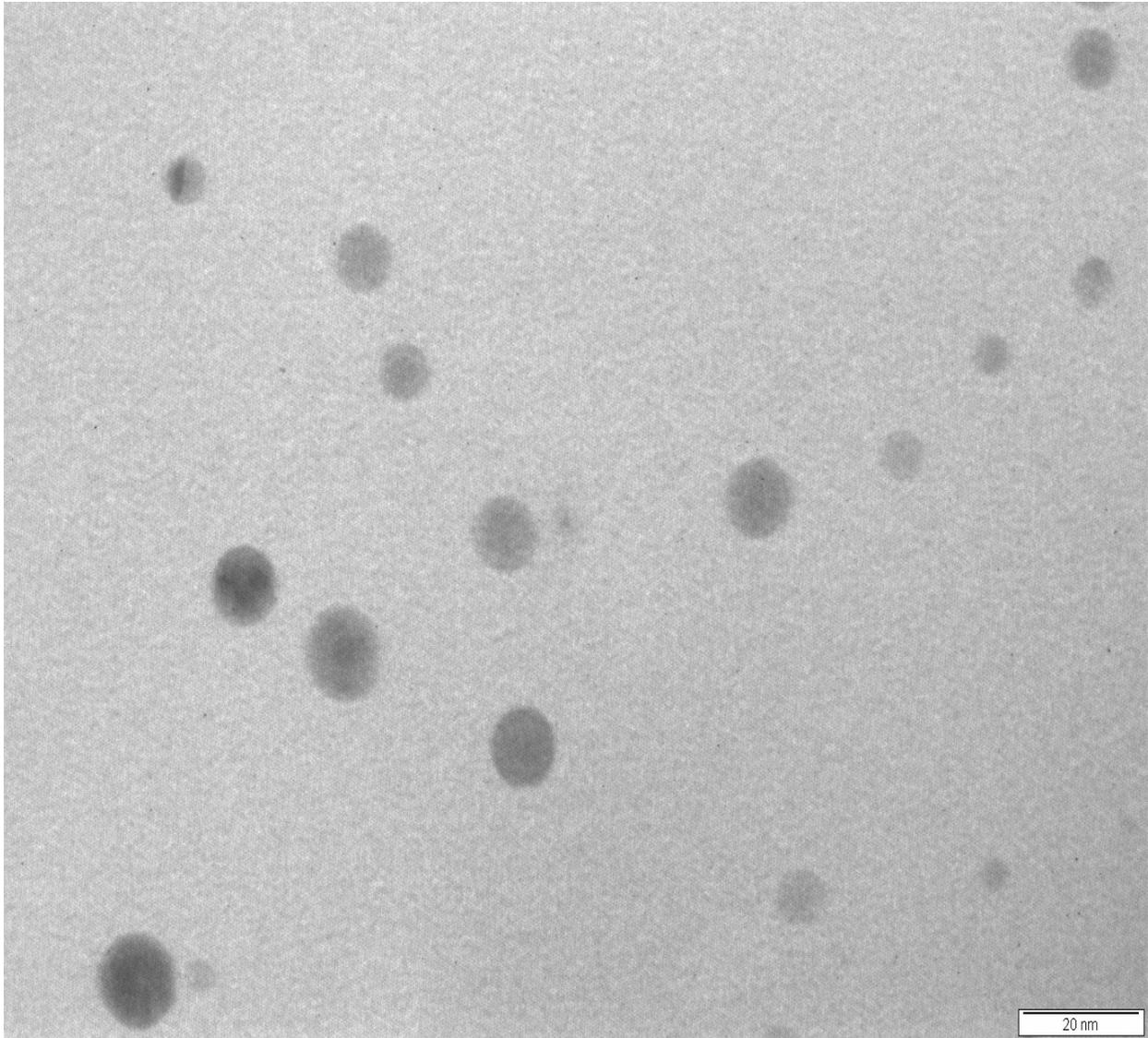


Fig: S3 (b) TEM image of silver particles in chitosan

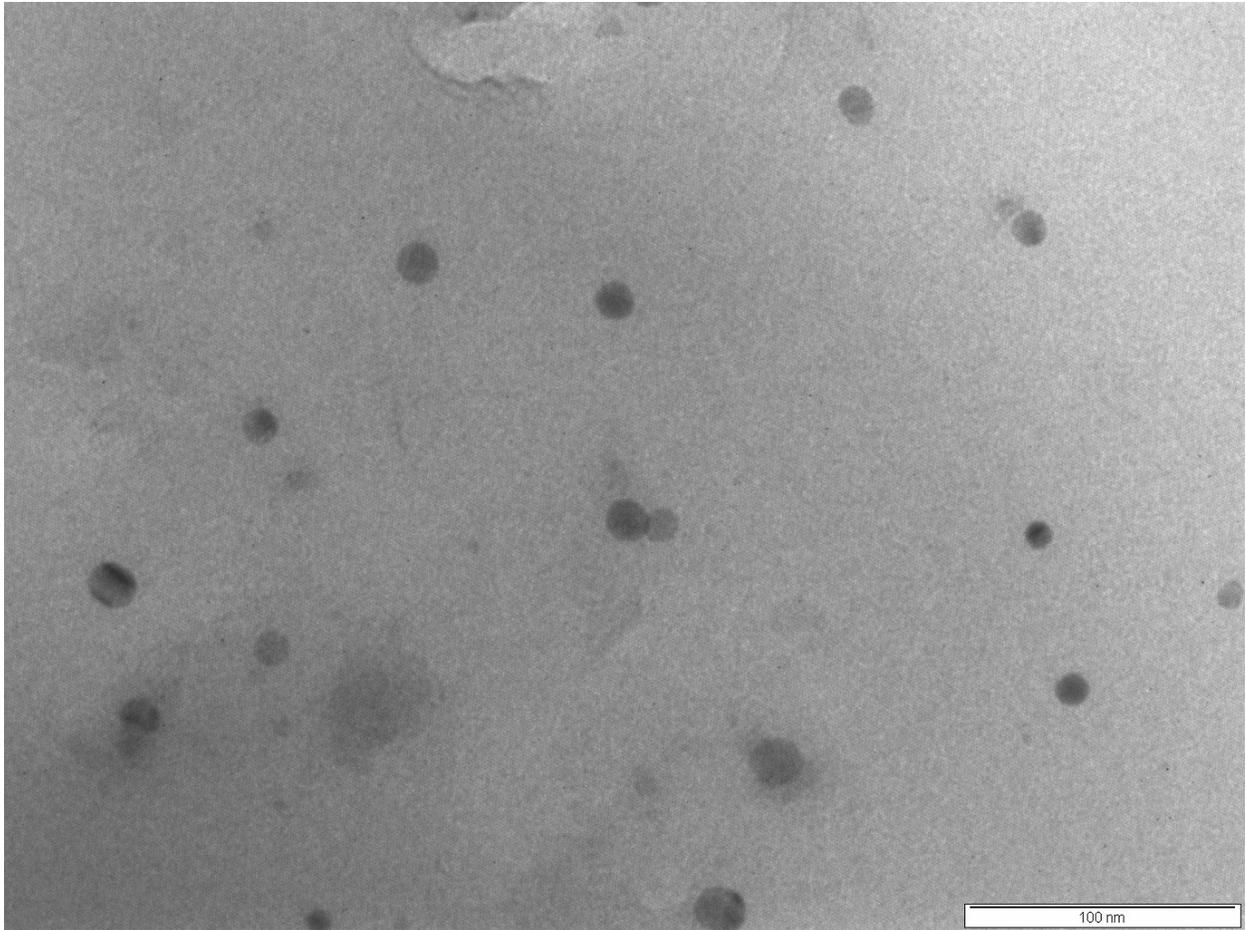


Fig: S3 (c) TEM image of silver particles in chitosan-polyacrylamide IPN network

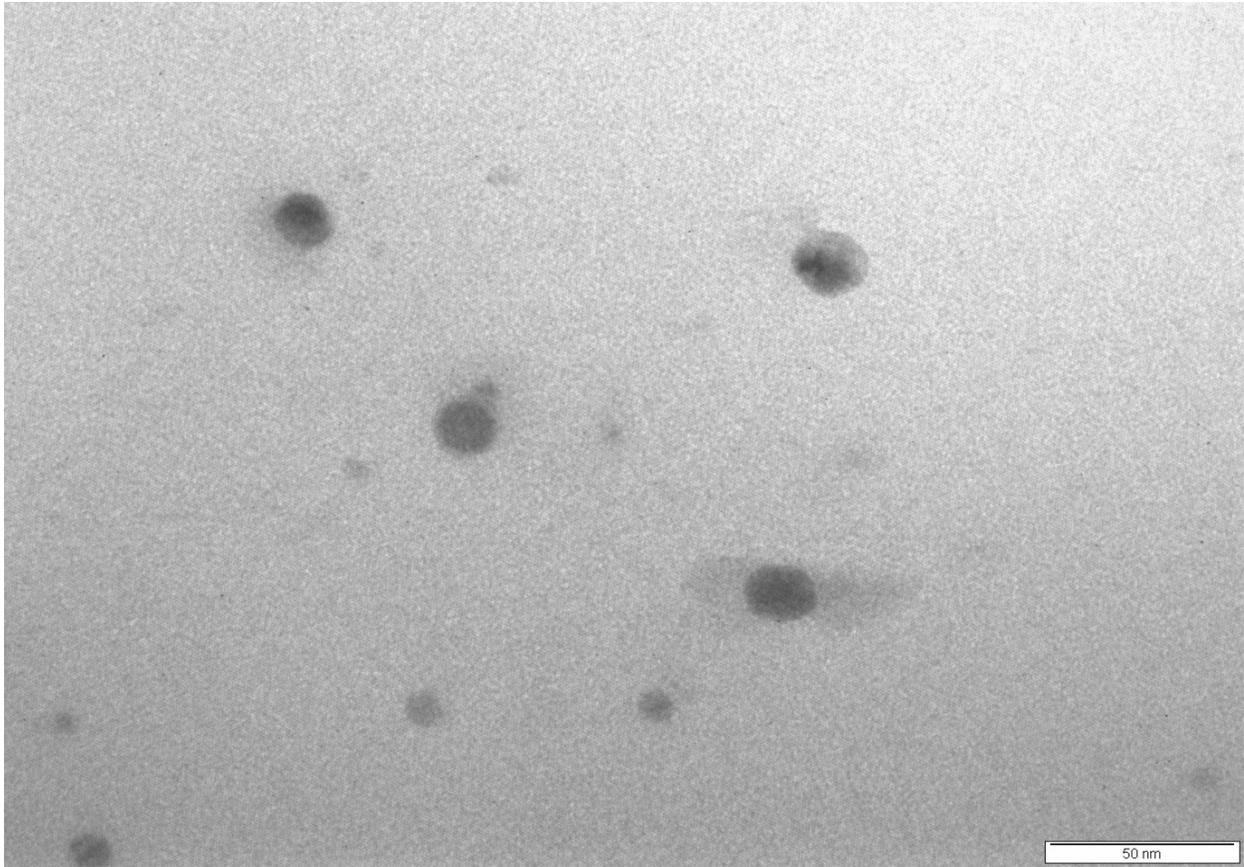


Fig. S3 (d) TEM image of silver particles in chitosan-polyacrylamide IPN network

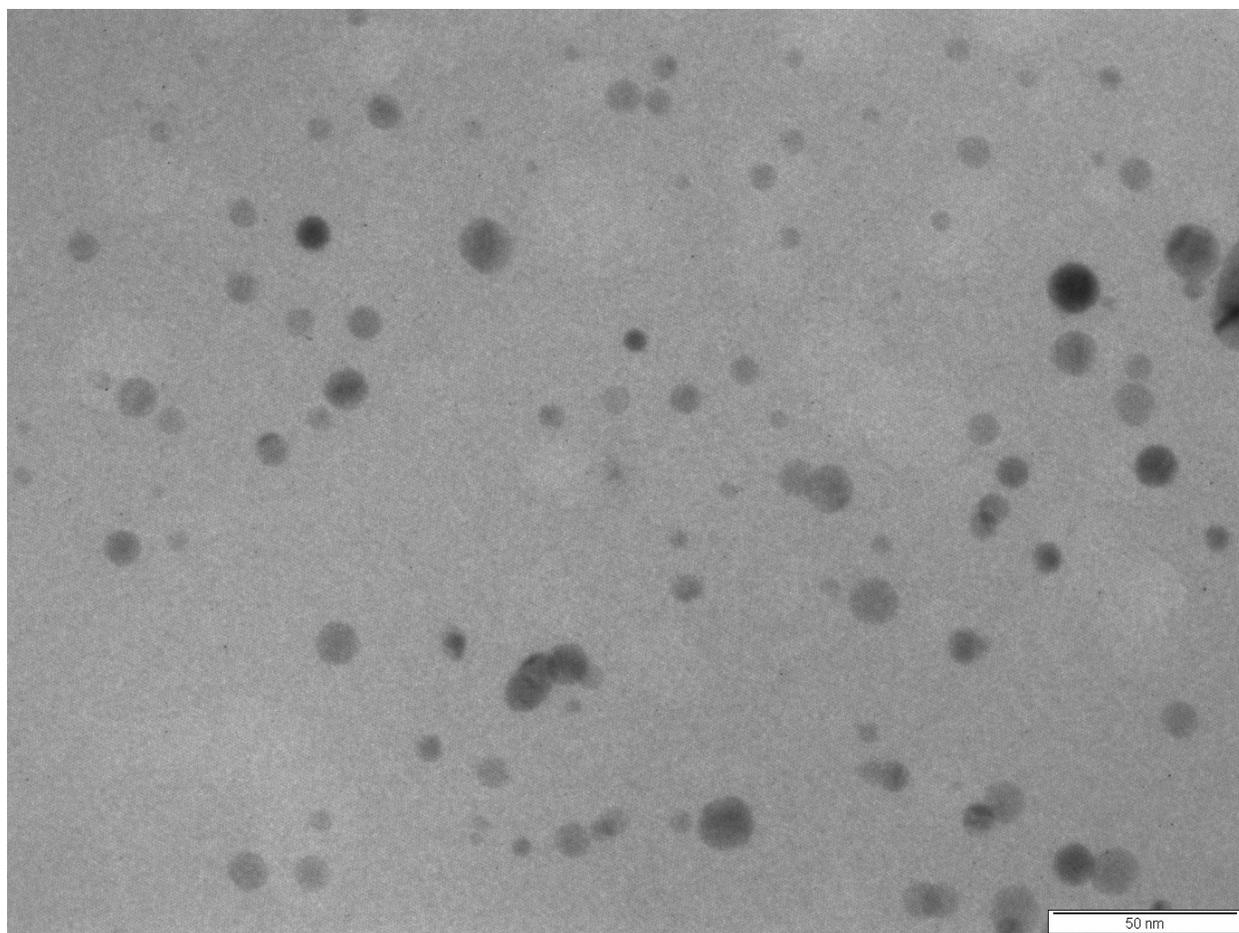


Fig. S4 (a) TEM image of Ag/chitosan catalyst after 7th cycle

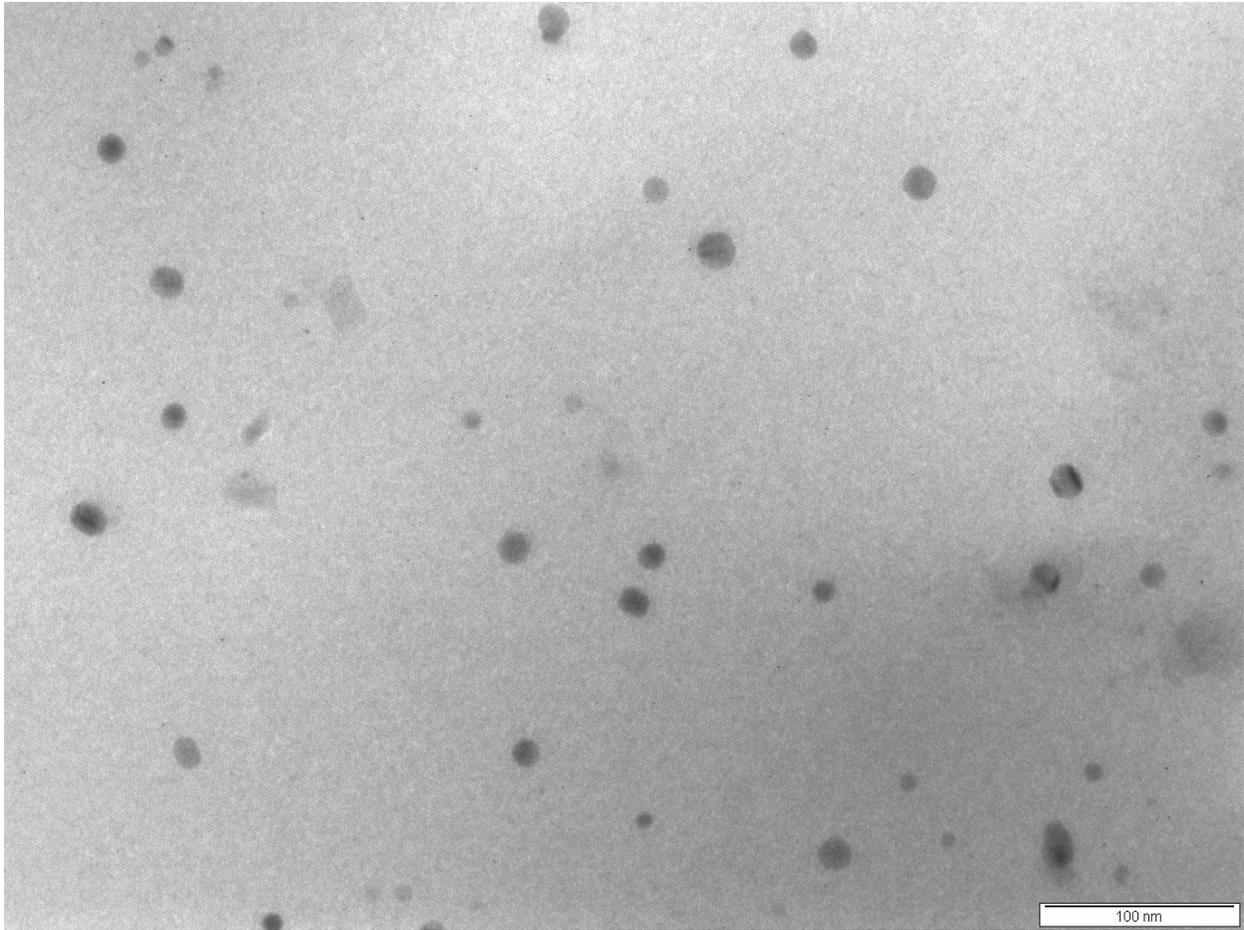
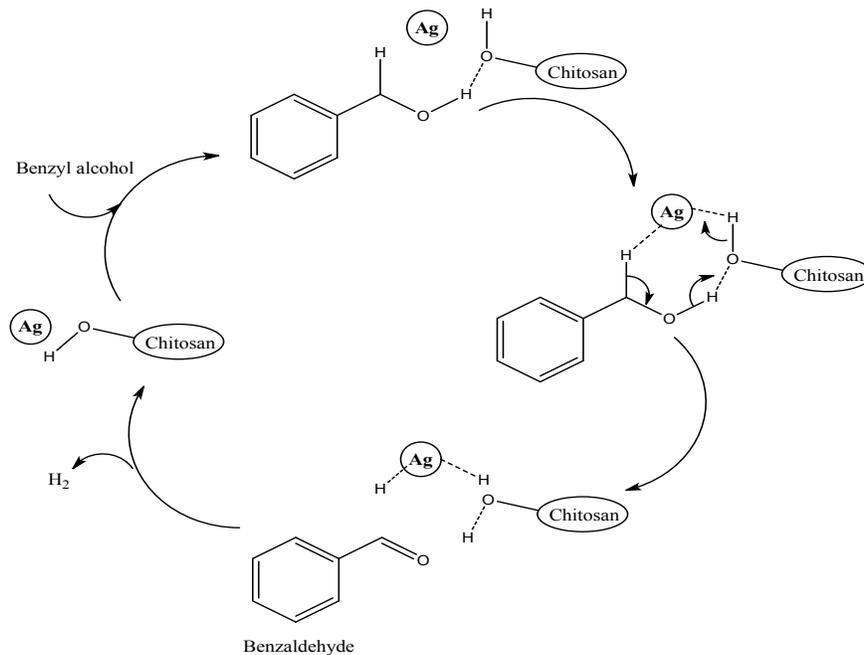


Fig. S4 (b) TEM image of Ag@IPN catalyst after 7th cycle

Plausible mechanism



In the first step, interaction of benzyl alcohol with –OH groups of chitosan by hydrogen bond interaction occurs. In the next step, cleavage of C-H bond of alcohol takes place to form aldehyde and adsorption of H₂ on silver. In the last step catalyst is regenerated with desorption of H₂ from silver nano particles.

Reference

Silver Nanoparticles Supported on Silica-Coated Ferrite as Magnetically and Reusable Catalyst for Oxidant-Free Alcohol Dehydrogenation

Ahmad Bayat, Mehdi Shakourian-Fard, Nona Ehyaei, Mohammad Mahmoodi Hashemia*

(Accepted Manuscript, article in press, RSC Advances)