

Electronic Supporting Information (ESI)

Controlled and stepwise generation of Cu_2O , $\text{Cu}_2\text{O}@\text{Cu}$ and Cu nanoparticles inside the transparent alumina films and their catalytic activity†

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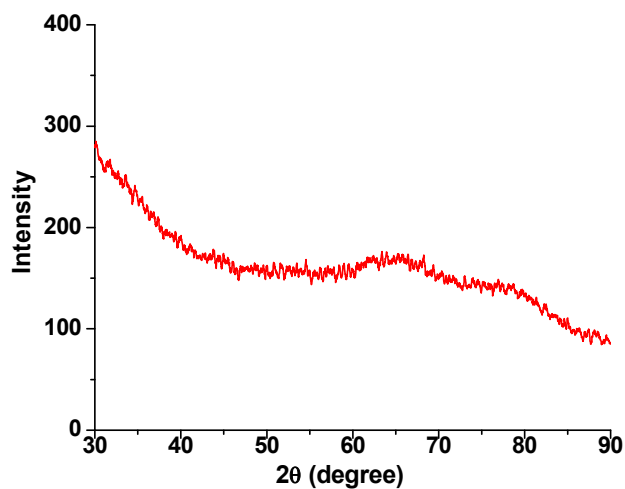


Fig. S1 GIXRD pattern of $\text{CuO}/\text{Al}_2\text{O}_3$ film heat-treated at 450 °C/air showing no characteristic peak of crystalline CuO.

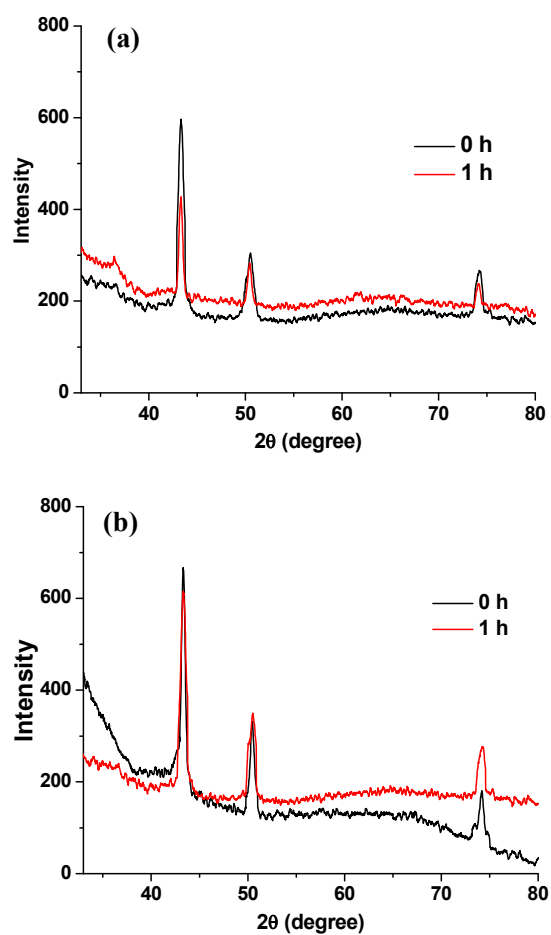


Fig. S2 GIXRD patterns of Film E (a) and Film F (b) taken immediately after heat-treatment in reducing atmosphere and after 1 h of storing in ambient condition.

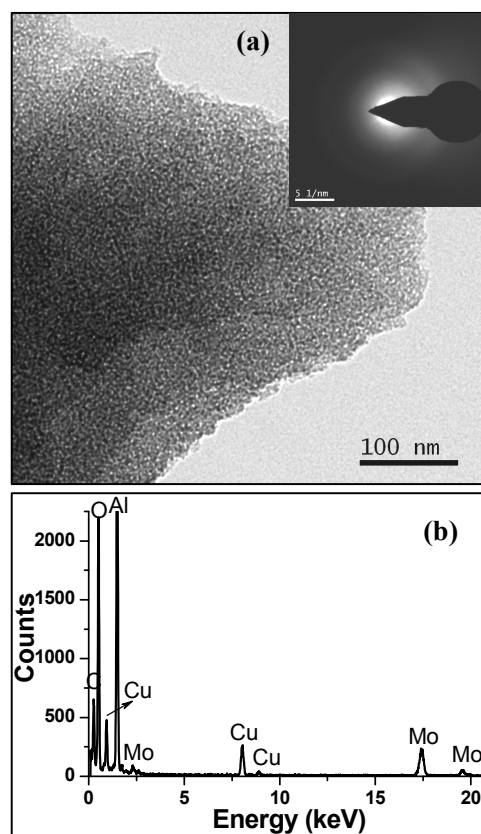


Fig. S3 (a) TEM image of CuO/Al₂O₃ film (450 °C/air; 1 h) shows absence of any discrete CuO NP, inset shows the SAED pattern revealing amorphous nature. (b) EDS taken from (a) shows the presence of Al, Cu and Mo. Peaks of Mo are from the Mo grid used for TEM study.

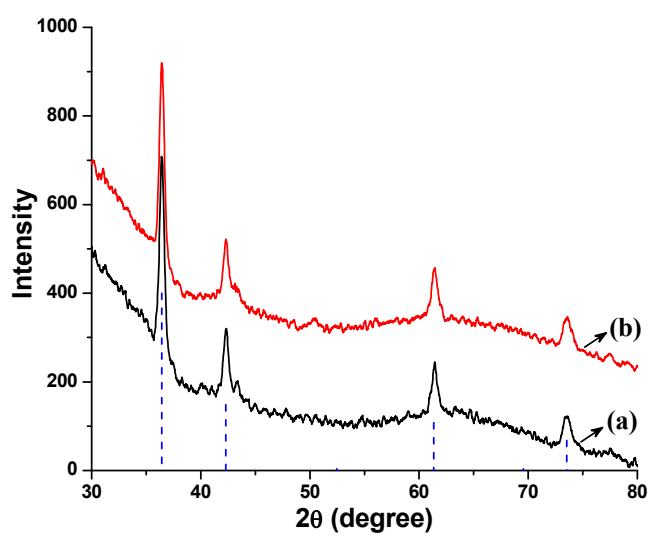


Fig. S4 GIXRD patterns of the Cu_2O NPs embedded film (Film A) taken before the catalytic reaction (a) and after 5 times use as catalyst (b) in congo-red degradation reaction.