



## Synthesis and Characterization of $Mn_3O_4$ Nanoparticle: A Catalyst for Synthesis of Tetrahydro-1H-pyrano[2,3-d]pyrimidine Derivatives

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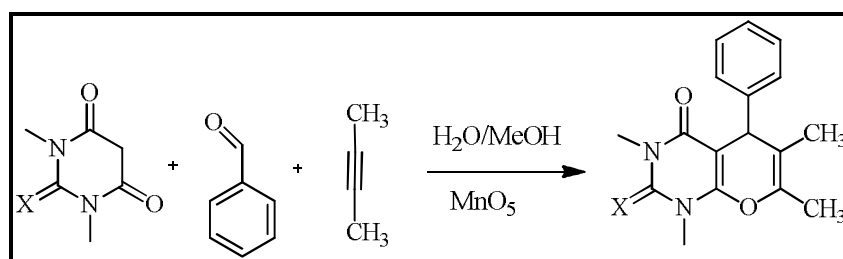
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### ABSTRACT

A mild and low temperature route has been developed for the synthesis of  $Mn_3O_4$  nanoparticles by mixing aqueous solution of  $Mn(CH_3CO_2)_2$  and KOH as an oxidizing agent in a simple hydrothermal reaction system in the absence of any templates, catalysts, or organic reagents. The synthesized nanoparticle of metal oxide were characterized by means of X-ray diffraction, UV-Visible spectrometry, Scanning electron microscope (SEM) and Transmission electron microscope (TEM). The crystal size of the synthesized metal chemical compound nanoparticle was obtained from X-ray diffraction study and it was found to  $50 \pm 5$  nm  $Mn_3O_4$  nanocrystalline. The synthesized catalyst ( $Mn_3O_4$ ) were used for activation of organic reagents lead to biologically potent tetrahydro-1H-pyrano[2,3-d] pyrimidine derivatives. The current methodologies both for the synthesis of nanocatalyst and then its application for heterocyclic synthesis disclose unique way of novel research.

### Graphical Abstract



Synthetic scheme of designing tetrahydro-1H-pyrano[2,3-d] pyrimidine derivatives

**Keywords:**  $Mn_3O_4$ , Nanoparticle, Hydrothermal synthesis, XRD, SEM, TEM, Crystal growth, Tetrahydro-1H-pyrano[2,3-d]pyrimidine.