

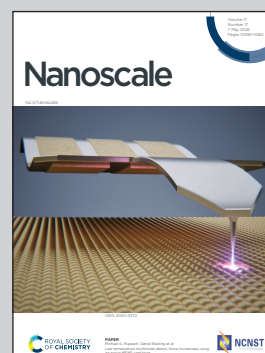
**Showcasing research from Professor Putla Sudarsanam's laboratory, Department of Chemistry, Indian Institute of Technology Hyderabad, Kandi 502284, Telangana, India.**

**Morphology-tuned  $\text{MnO}_x/\text{TiO}_2$  nanocatalysts for recycling PET plastic waste using biomass-derived ethylene glycol**

The study elucidated the efficient recycling of PET waste using a cost-effective and sustainable  $\text{MnO}_x/\text{TiO}_2$  nanocatalyst. The synergy of  $\text{MnO}_x$  nanoparticles with  $\text{TiO}_2$  nanorods led to surface-enriched basic sites and electron-deficient  $\text{Mn}^{3+}/\text{Mn}^{2+}$  species with a significant effect on activating ethylene glycol and PET ester linkages, respectively, towards the formation of a highly valuable monomer for the plastic industry, reducing the use of fossil-derived precursors. The morphology-tuned catalyst design concept could pave the way for developing new heterogeneous catalytic materials and practically viable catalytic processes for the circular plastic economy.

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**As featured in:**



See Bhattu Swapna and Putla Sudarsanam, *Nanoscale*, 2025, 17, 10620.