



Research article

Synergized mechanistic and solar photocatalysis features of N-TiO₂ functionalised activated carbon

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Abstract: A TiO₂ photocatalysts was successfully functionalised by employing nitrogen (N) as a dopant on activated carbon (AC) support as synergist. Two different types of activated carbon adopting namely *Garcinia mangostana* and palm shell as precursor were chosen as an activated carbon support. Thus the synthesized samples were examined for its physical and chemistry properties through advanced microscopic and spectroscopic techniques. The results revealed the contribution of adsorbent support through the rich surface area while doping of nitrogen contributed for effectively utilizing the incident photons by narrowing the band gap energy. The synergetic adsorption-photocatalytic activity was investigated by adopting batik dye, Remazol Brilliant Blue Dye (RBB) as model pollutant. Thus the N-TiO₂ functionalised activated carbon demonstrated excellent adsorption-photocatalytic activity with 80% removal efficiency in 6 h. The synergism of adsorption-photocatalysis portrayed the alternative for treating recalcitrant RBB a predominant dye found in batik textile industry wastewater.

Keywords: N-TiO₂; activated carbon; functionalization; synergistic; adsorption-photocatalysis
