Supplementary Material

Sunlight driven photocatalytic performance of Pt nanoparticle decorated sulfonated graphene-TiO_2 nanocomposite

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1. Evaluation of optimal composition of Pt loading:

In order to make relative comparison, we have investigated the photocatalytic performance of Degussa P25, TiO_2, SGTPt1.5, SGTPt2.0 and SGTPt3.0 photocatalyst compared.

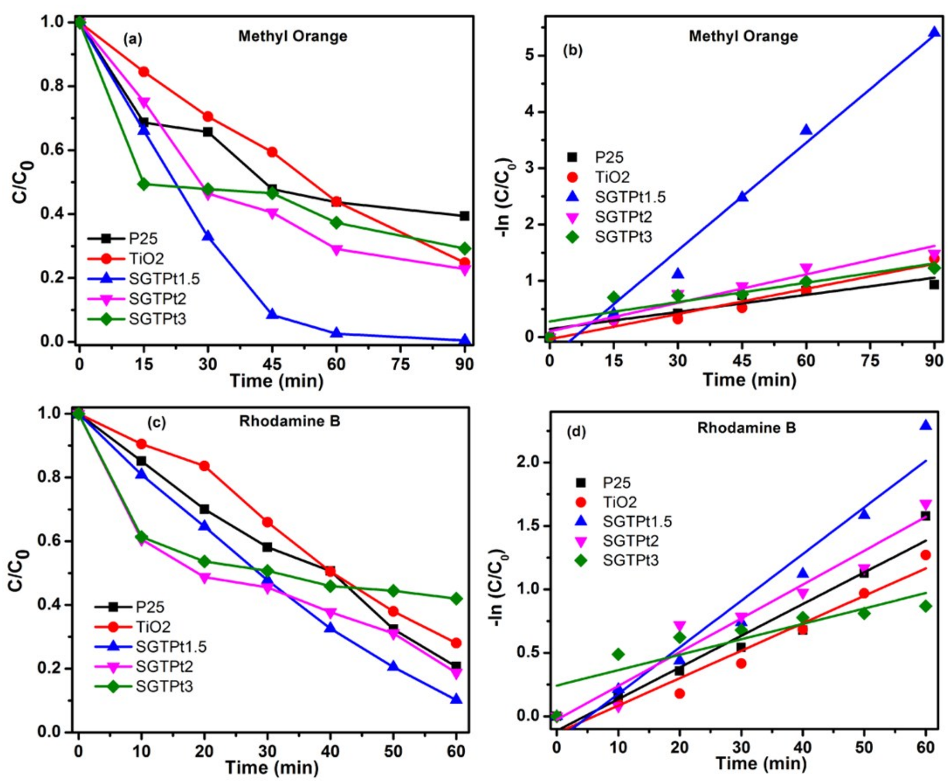

Fig.S1. MO and Rh.B degradation by P25, TiO_2, SGTPt1.5-3: (a, c) rate of removal; (b, d) reaction kinetics curves.

Methyl orange and Rhodamine B dyes degradation at pH-7 have been studied and given in Figure S1. Degussa P25 photocatalyst exhibits enhanced photocatalytic performance for Rhodamine B dye degradation and less photocatalytic performance for Methyl orange degradation compared to synthesized TiO_2 nanoparticles under similar experimental conditions. It is also noted that in the case of SGTPt2.0 the photocatalytic performances for cationic and anionic dyes are markedly declined on comparison to SGTP1.5 nanocomposite. It may be due to blocking more active sites of TiO_2 and more amount Pt NPs leading to decrease the absorption of light. In brief, the SGTPt1.5 composition appears to be optimally performing photocatalysis of wide range of dyes.

Table.S1. Reaction rate constants of methyl orange and Rhodamine B degradation by various composite photocatalyst.

Catalyst	**Pseudo-first order rate constant of the photocatalytic reaction k_{app} (× 10^{-3} min^{-1})**	
	MO	**Rh.B**
	pH-7	**pH-7**
P25	10.1 ± 1.8	24.9 ± 2.7
TiO_2	14.6 ± 1.1	21.6 ± 2.0
SGTPt1.5	64.8 ± 3.7	52.6 ± 6.7
SGTPt2	16.8 ± 1.9	26.6 ± 2.7
SGTPt3	11.4 ± 2.7	12.1 ± 2.8