

## Support file

### Photocatalytic degradation of dyes in water by analytical reagent grade ZnO, TiO<sub>2</sub> and SnO<sub>2</sub>: A comparative study

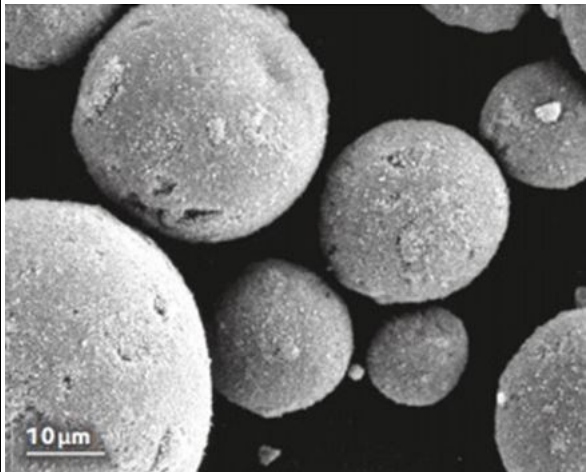
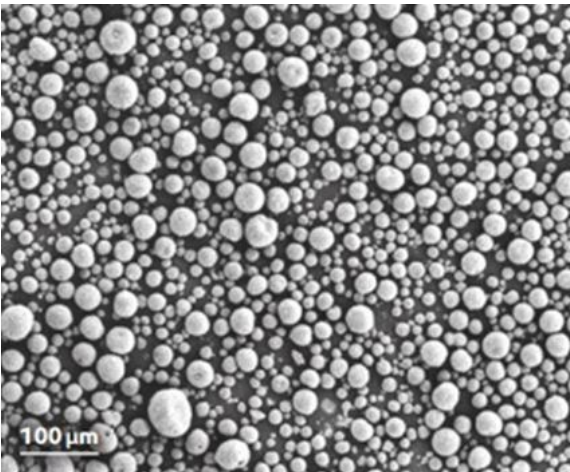
Dnyaneshwar R. Shinde, Popat S. Tambade\*, Manohar G. Chaskar, Kisan M. Gadave

Prof. Ramkrishna More Arts, Commerce and Science College, Akurdi, Pune-44,

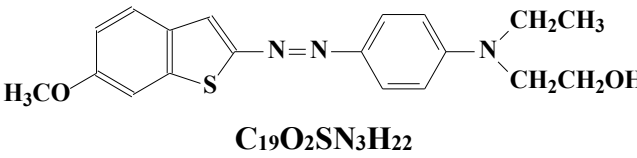
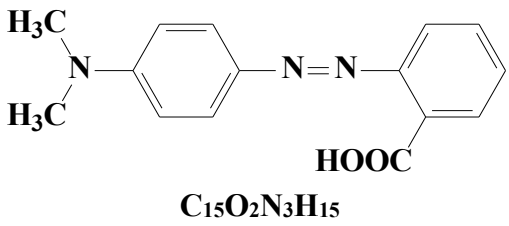
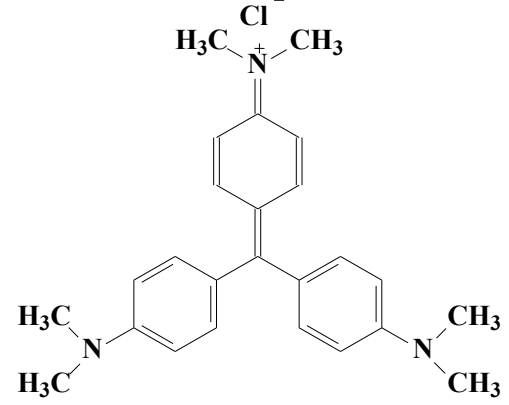
Affiliated Savitribai Phule Pune University (India)

Correspondence: Popat S. Tambade (pstam3@rediffmail.com)

**Table-1: Characteristic of Degussa P25 (TiO<sub>2</sub>) photocatalyst (As per manufacturers information)**

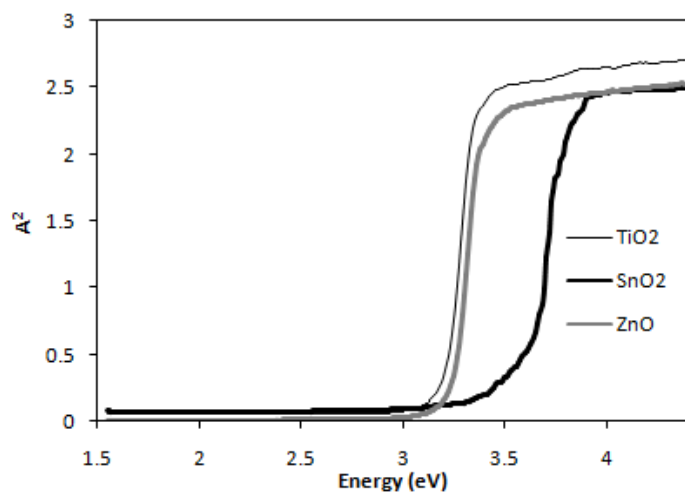
Material	Degussa TiO <sub>2</sub> p25 Nanoparticles
SEM of Degussa P-25 photocatalyst	
	
APS	25nm
Rutile	20 %
Anatase	80 %
Moisture	<1.5 Wt%
Loss of weight in drying	< 2.0 %
Loss of weight in burning	< 1.0 %
<b>Assay</b>	<b>99.9%</b>
Al	< 17ppm
Mg	< 65ppm
Si	<120ppm
Fe	9.75
Ca	<75ppm
S	< 130ppm
Nb	< 80 ppm

**Table-2:** Structural information of dyes

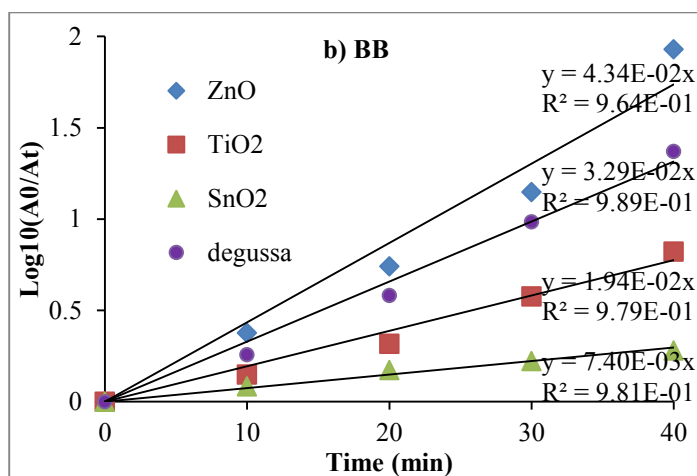
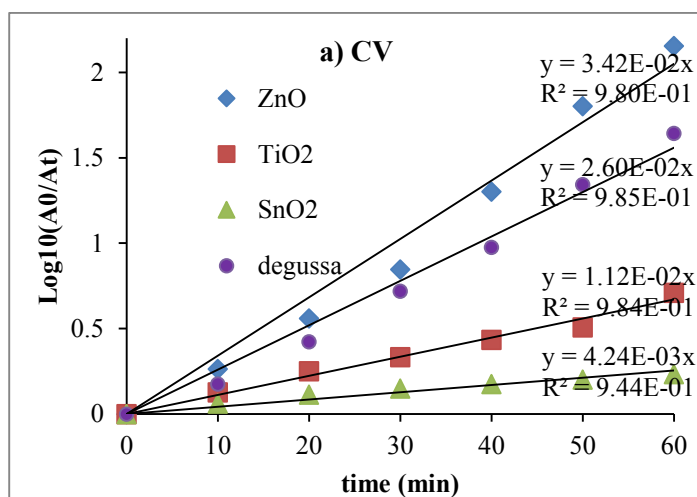
Sr. No.	Name of the Dye	Structure and mol. formula	$\lambda_{\text{max}}$ at specific pH of dye soln.	Mol. Wt.
1	Basic Blue - 41 (BB)	 $\text{C}_{19}\text{O}_2\text{SN}_3\text{H}_{22}$	605.2 nm pH=7	482.7 g
2	Methyl Red (MR)	 $\text{C}_{15}\text{O}_2\text{N}_3\text{H}_{15}$	517.6 nm pH = 4	269.31 g
3	Crystal Violet (CV)	 $\text{C}_{25}\text{H}_{30}\text{ClN}_3 \cdot 9\text{H}_2\text{O}$	592.4 nm pH=7	570.12 g

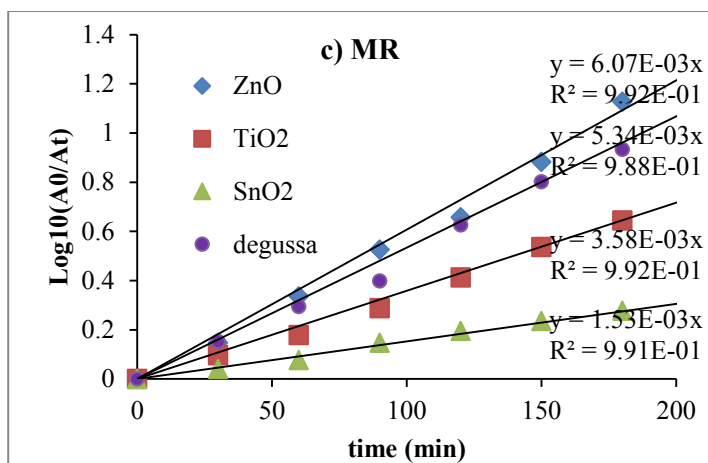
**Table-3:** COD of the dyes at the time of decolourization on ZnO photocatalyst and at 4 hr. of irradiation time

Dye	Initial COD (ppm)	% removal COD		
		at the time decolourization	4 h irradiation time	5 h irradiation time
Crystal Violet	76.8±3.2	46.3±4.8	91.6±2.1	92.2±2.9
Basic Blue	63.85±4.7	52.9±5.6	94.9±1.9	95.6±2.6
Methyl orange	81.98±5.2	38.1±3.8	87.2±3.5	89.3±3.7

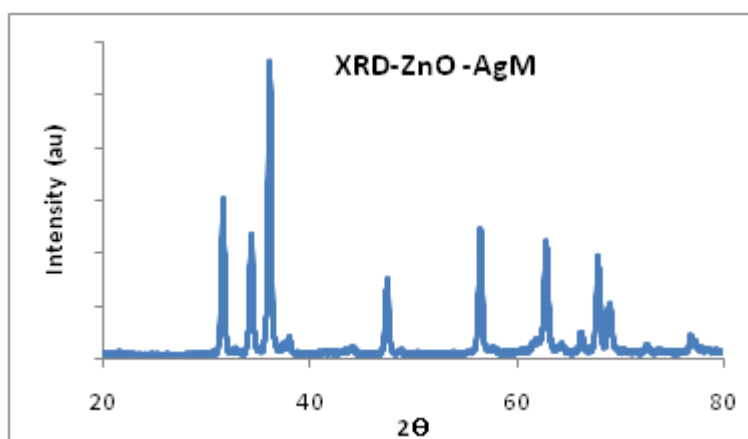


**Fig-1:** Graph  $A^2$  against energy constructed from UV-DRS in absorbance mode to evaluate band gap

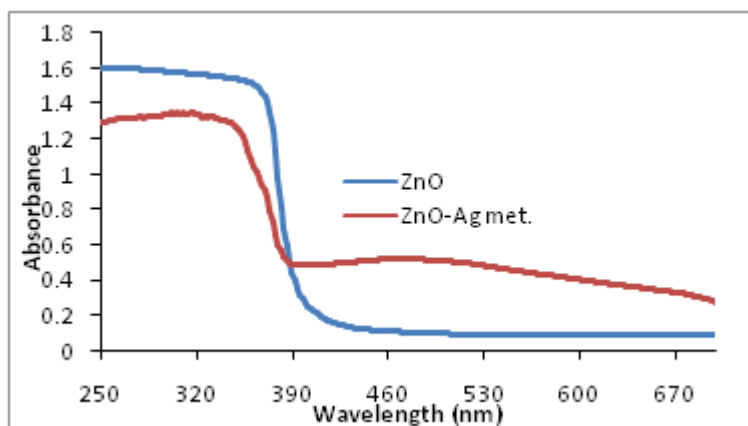




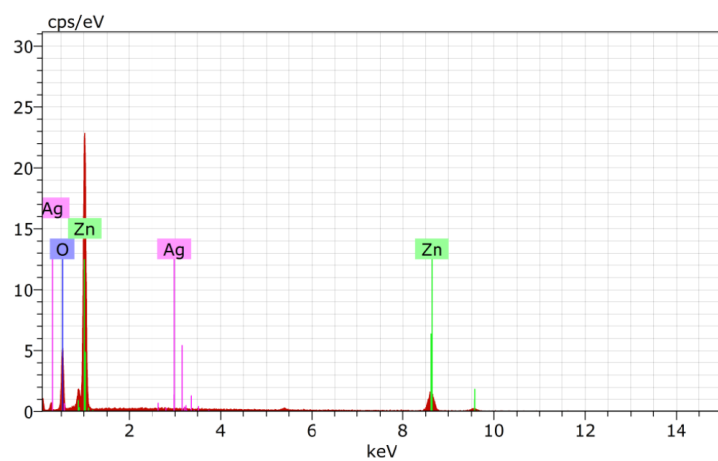
**Figure-2:** Graph of  $\log_{10}(A_0/A_t)$  against time for the evaluation of rate constants of decolourization of dyes on photocatalysts



**Figure-3:** XRD of Silver metal sensitized ZnO



**Figure-4:** UV-DRS in absorbance mode of ZnO and Silver metal sensitized ZnO



**Figure-5:** EDS Silver metal sensitized ZnO