

## Supplementary information

### $\alpha$ - MoO<sub>3</sub>/Polyaniline composite for effective scavenging of Rhodamine B, Congo red and textile dye effluent

S Dhanavel<sup>a</sup>, E A K Nivethaa<sup>a</sup>, K Dhanapal<sup>a</sup>, V.K. Gupta<sup>b,c</sup>, V Narayanan<sup>d</sup> and A Stephen<sup>a,\*</sup>

<sup>a</sup>Material Science Centre, Department of Nuclear Physics, University of Madras, Guindy Campus, Chennai-25, India.

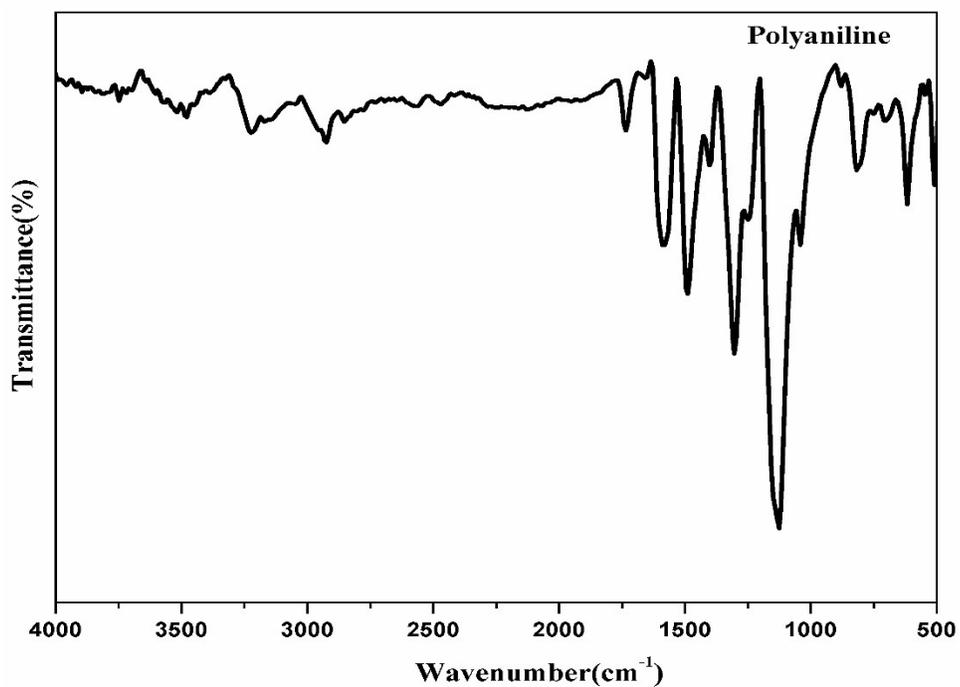
<sup>b</sup>Department of Chemistry, Indian Institute of Technology Roorkee, Roorkee 247667, India

<sup>c</sup>Department of Applied Chemistry, University of Johannesburg, Johannesburg, South Africa

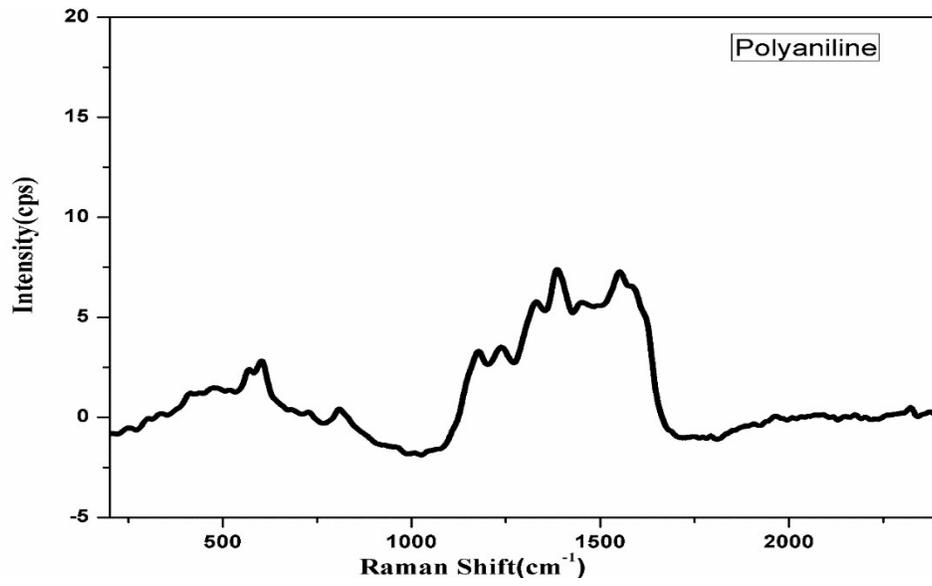
<sup>d</sup>Department of Inorganic Chemistry, University of Madras, Guindy Campus, Chennai 600 025, India.

\*E-mail- [stephen\\_arum@hotmail.com](mailto:stephen_arum@hotmail.com)

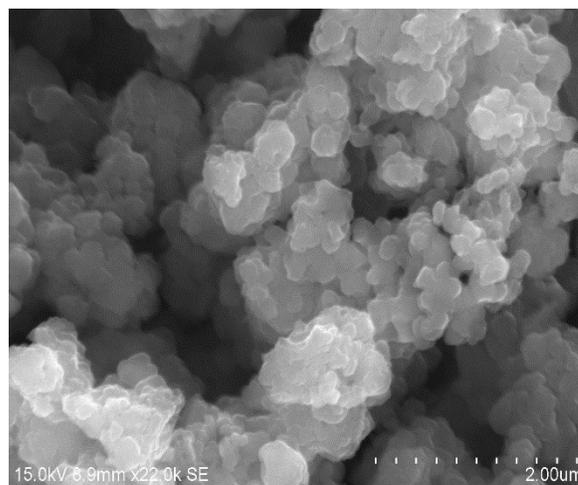
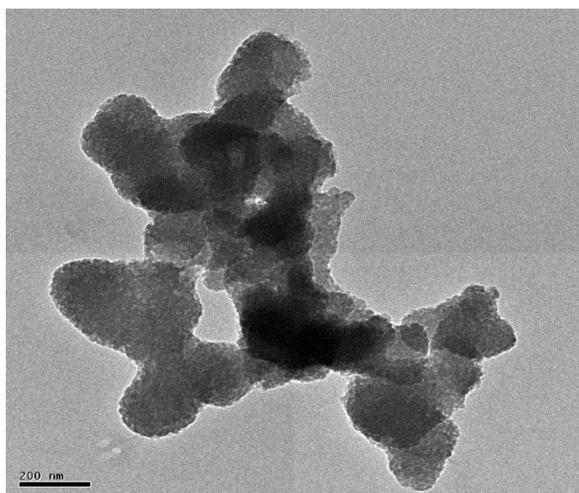
Phone: 044-22202802, Fax. 044-22351269



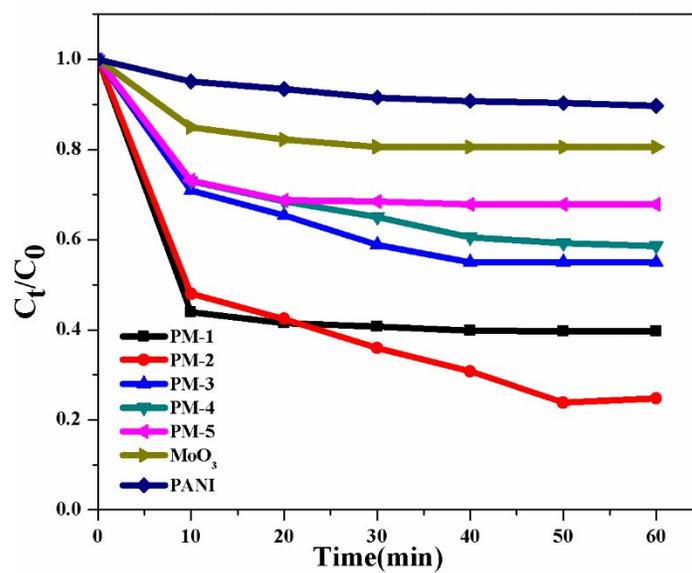
S1. FTIR spectrum of Polyaniline



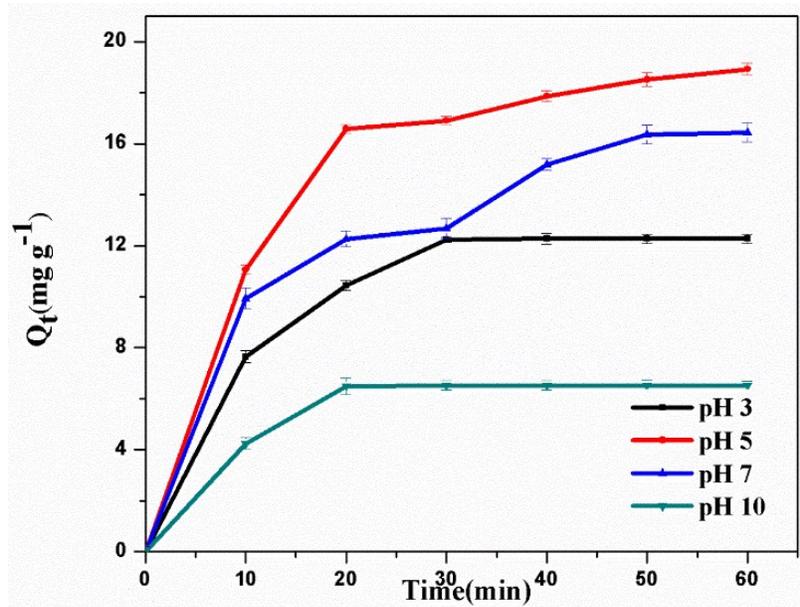
S2. Raman spectrum of polyaniline



S3. TEM and FESEM image of polyaniline



S4. Time dependent dye removal performance of MoO<sub>3</sub>, PANI and its composites on RhB

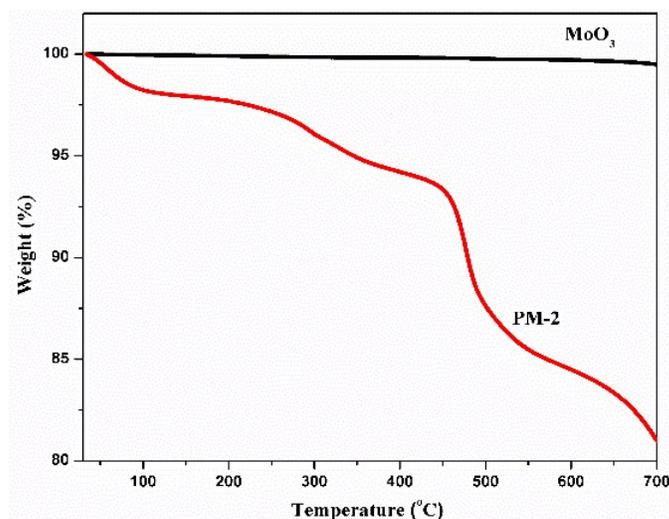


S5. Effect of pH on adsorption capacity of PM-2 on CR

## Thermogravimetric analysis

Thermal stability was investigated using thermogravimetric analyzer (TGA), Perkin Elmer model TGA Q50 V20.13 Build 39. TGA measurements were performed in nitrogen atmosphere keeping the nitrogen flow rate at  $40 \text{ ml min}^{-1}$ . The heating rate in TGA measurements was kept at  $20 \text{ }^\circ\text{C min}^{-1}$ .

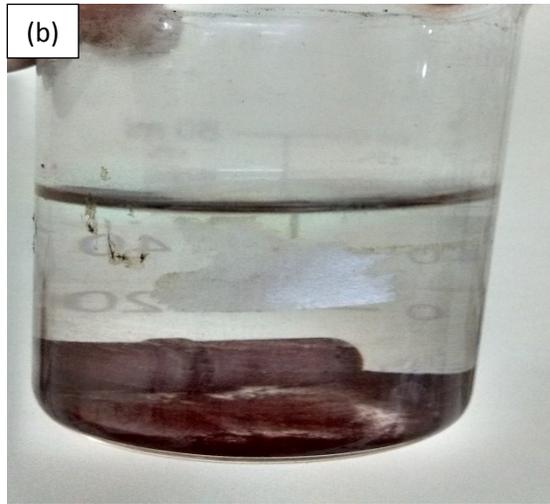
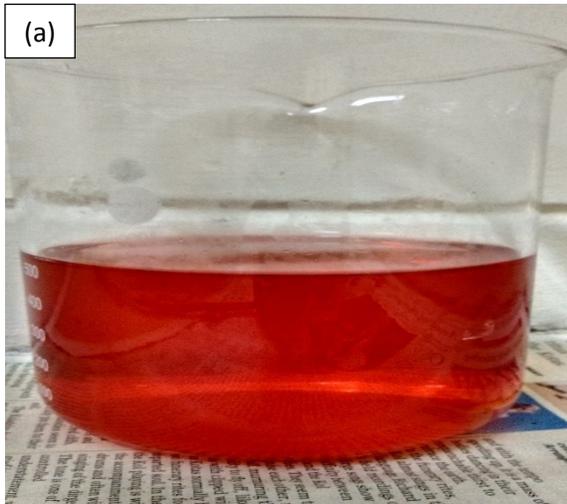
The TG curves of the  $\text{MoO}_3$  and PM-2 are shown in S.6. Initial weight loss observed for PM-2 around  $100^\circ\text{C}$  which is due to the release of surface absorbed water molecule presence in PANI. The second step, the weight loss from  $130^\circ\text{C}$  to  $270^\circ\text{C}$  is caused by the dedoping and decompose of camphor sulphonic acid from PANI in the composites. This is followed by a rapid loss of weight until  $700^\circ\text{C}$  is ascribed due to the degradation and decomposition of polymer backbone. Especially the steeper slope in the region indicates the structural changes of PANI from composites<sup>1,2</sup>.



S6. TGA curves of  $\text{MoO}_3$  and  $\text{MoO}_3/\text{PANI}$  composite (PM-2)



S7. Color of the RhB dye (a) Before and (b) after adsorption.



S8. Color of the CR dye (a) Before and (b) after adsorption.

References:

1. X. Wang, Y. Shen, A. Xie, S. Chen, *Mater. Chem and Phys*, 2013, 140, 487-492.
2. S. Rajagopal, D. Nataraj, O.Y. Khyzhun, Y. Djaoued, J. Robichaud, K. Senthil, D. Mangalaraj, *CrystEngComm*, 2011, 13, 2358-2368.