

Polyethylene glycol (PEG₄₀₀) modified layered double hydroxides: synthesis, characterization and study on adsorption characteristics for removal of acid orange II from aqueous solution

Sujata Mandal^{*,†}, Sandhya Kalaivanan[‡], Asit Baran Mandal^{§,#}

[†] CLRI-Centre for Analysis, Testing, Evaluation & Reporting Services, CSIR-Central Leather Research Institute, Adyar, Chennai-600020, Tamilnadu, India

[§]CSIR-Central Leather Research Institute, Adyar, Chennai-600020, Tamilnadu, India.

[#]Present address: CSIR-Central Glass and Ceramic Research Institute, 196 Raja S. C. Mullick Road, Jadavpur, Kolkata 700032, India.

Corresponding author's contact information

*SujataMandal: sujata@clri.res.in. Tel.: +91-44-24437167

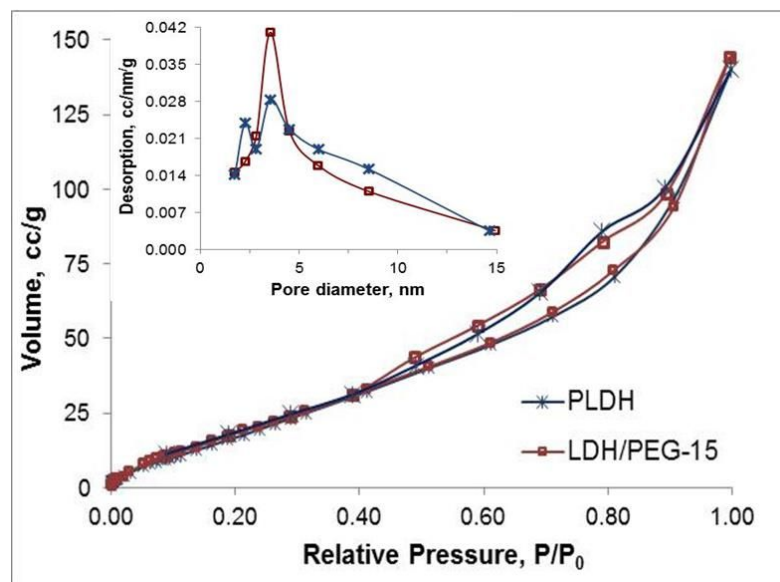


Figure S1. Nitrogen adsorption–desorption isotherms taken at 77 K and the BJH desorption plots of pore volume versus pore diameter for the PLDH and LDH/PEG-15.

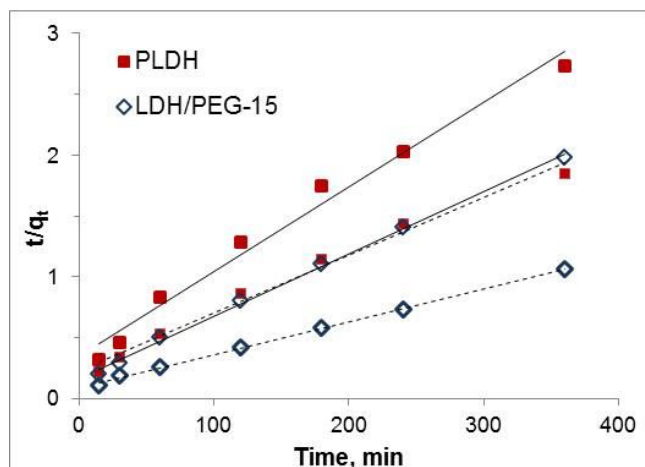


Figure S2. Pseudo second-order kinetic plots for the PLDH and the LDH/PEG-15 (solid lines for 100 mg/l and dotted lines for 200 mg/l of initial AO-II concentration).

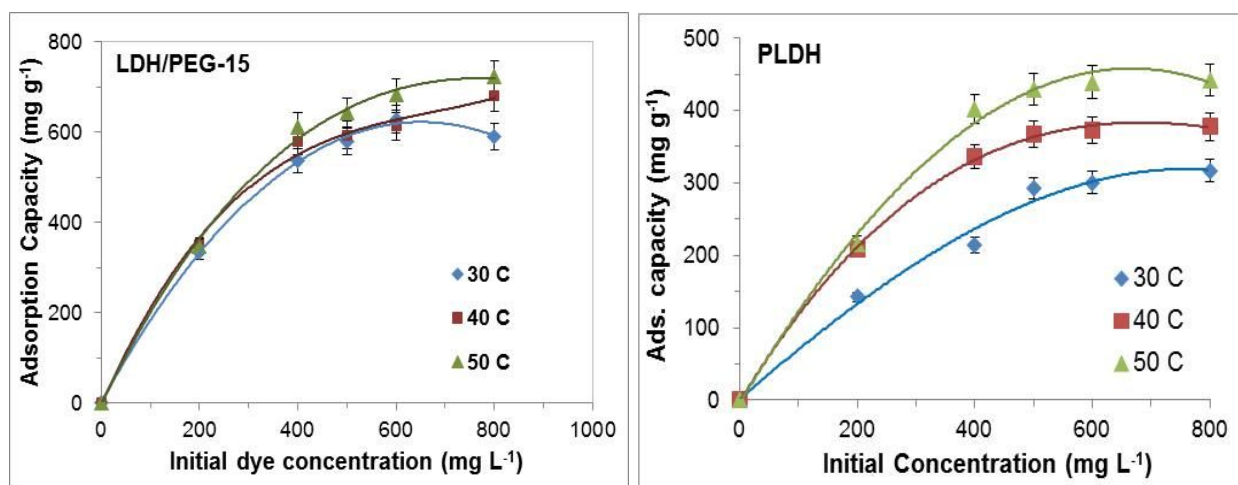


Figure S3. AO-II uptake per gram of the adsorbents as a function of initial AO-II concentration at different reaction temperatures (Initial AO-II concentration: 0 - 800 mg/l, adsorbent dose: 0.5 g/l, contact time: 2 h, error bar represents 5% error value).

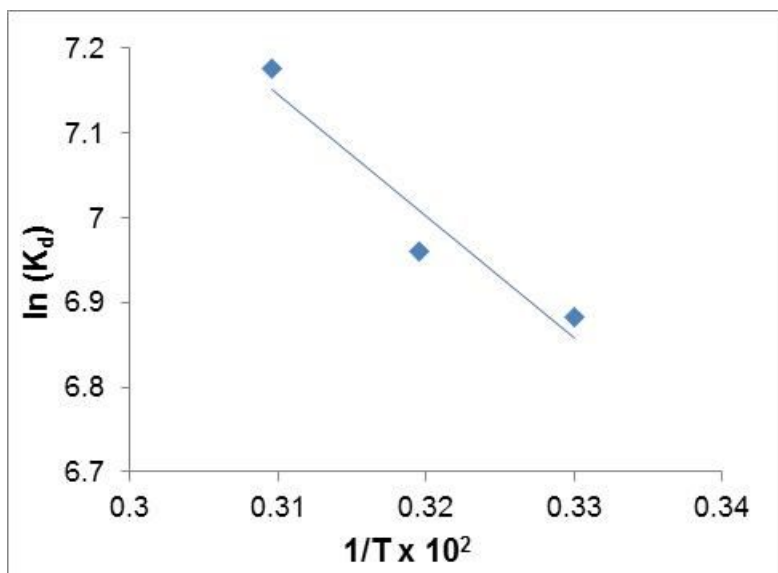


Figure S4. Van't Hoff plot showing relationship between $1/T$ and $\ln(K_d)$

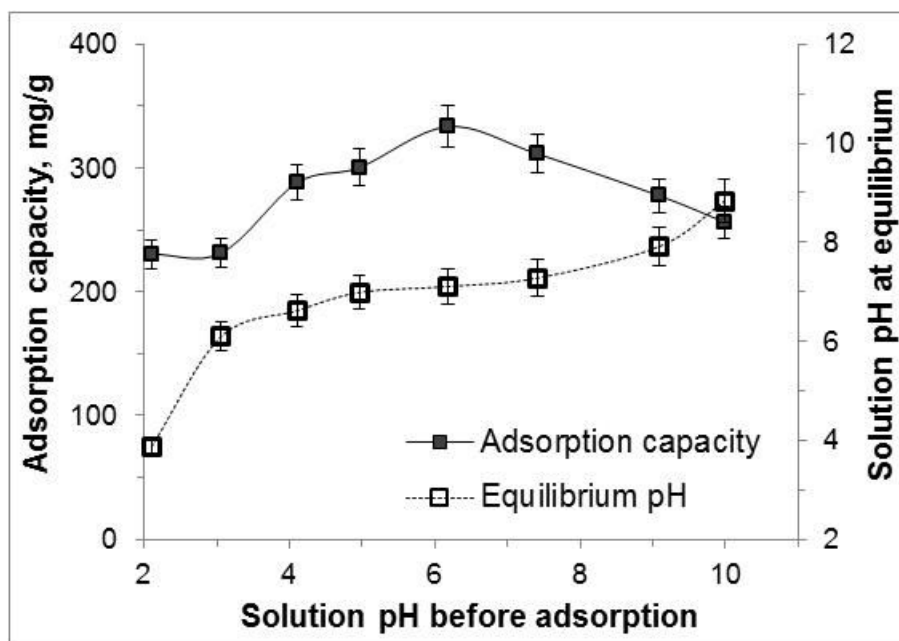
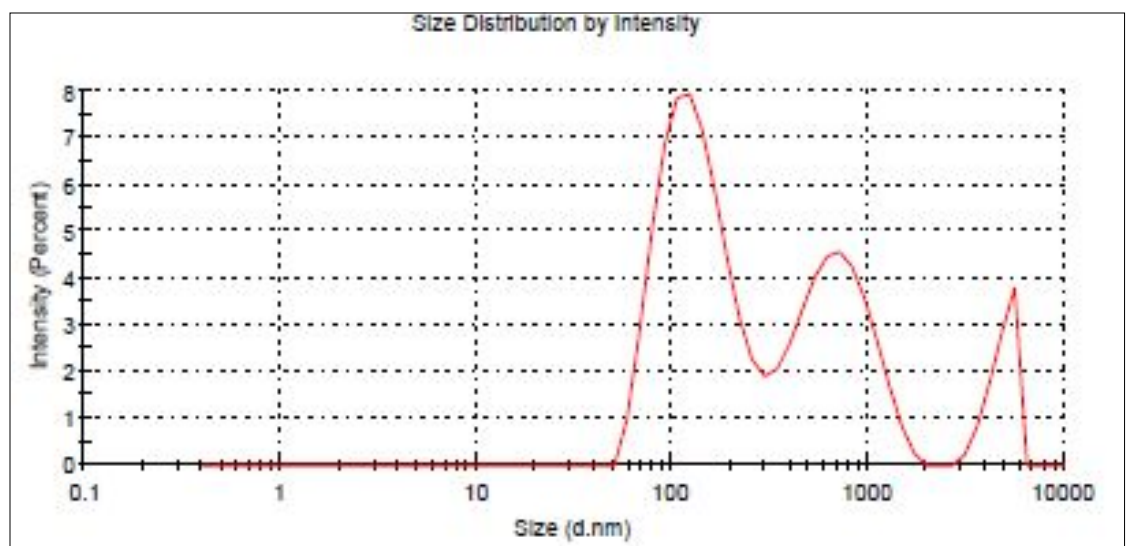
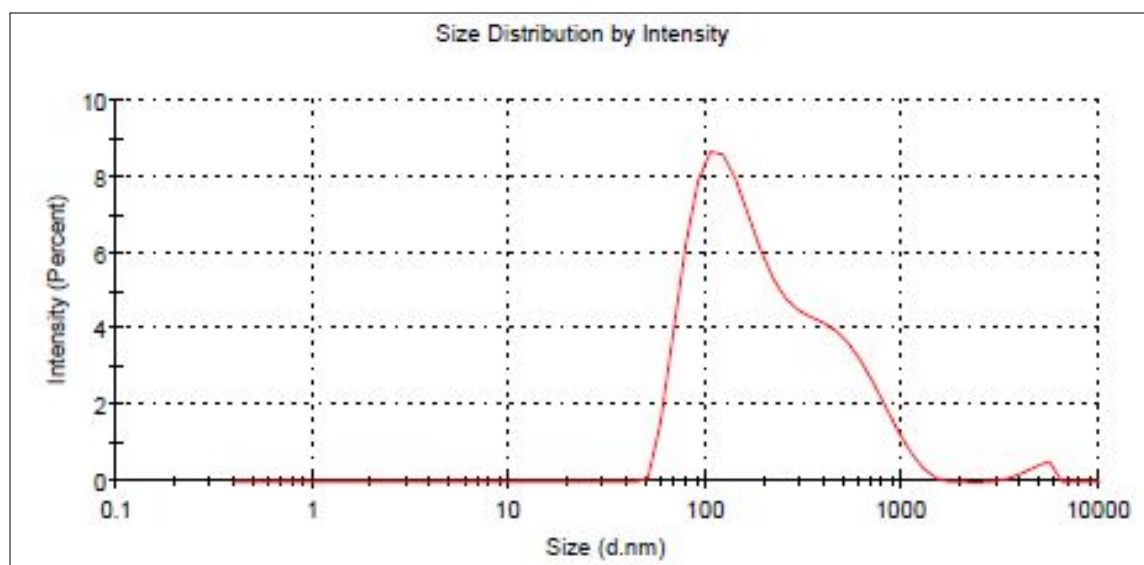


Figure S5. Influence of solution pH on the AO-II adsorption capacity of the PLDH and the LDH/PEG-15, and on the equilibrium pH of the solution (Initial AO-II concentration: 200 mg/l, contact time: 2 h, temp: 30 °C, adsorbent dose: 0.5 g/l).



Results		Size (d.nm):	% Intensity:	St Dev (d.nm):	
Z-Average (d.nm):	216.8	Peak 1:	137.3	55.2	56.29
Pdl:	0.634	Peak 2:	708.0	35.4	298.5
Intercept:	0.942	Peak 3:	4831	9.3	715.0
Result quality :	Good				

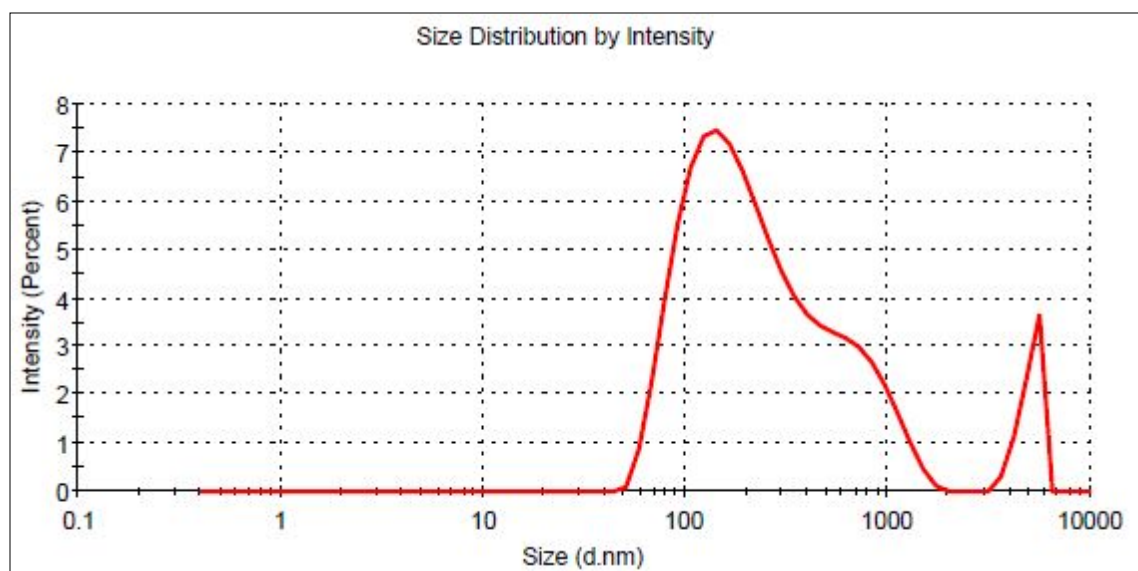
Figure S6. Particle size distribution of the Pristine LDH (PLDH).



Results

	Size (d.nm):	% Intensity:	St Dev (d.nm):
Z-Average (d.nm): 160.8	Peak 1: 259.2	98.6	224.0
Pdl: 0.331	Peak 2: 4815	1.4	719.5
Intercept: 0.987	Peak 3: 0.000	0.0	0.000
Result quality: Good			

Figure S7. Particle size distribution of the LDH/PEG-15.



Results

	Size (d.nm):	% Intensity:	St Dev (d.nm):
Z-Average (d.nm): 218.8	Peak 1: 205.9	73.8	108.5
Pdl: 0.550	Peak 2: 926.4	16.5	334.5
Intercept: 0.961	Peak 3: 4837	8.1	715.0

Result quality : Good

Figure S8. Particle size distribution of the LDH/PEG-50.

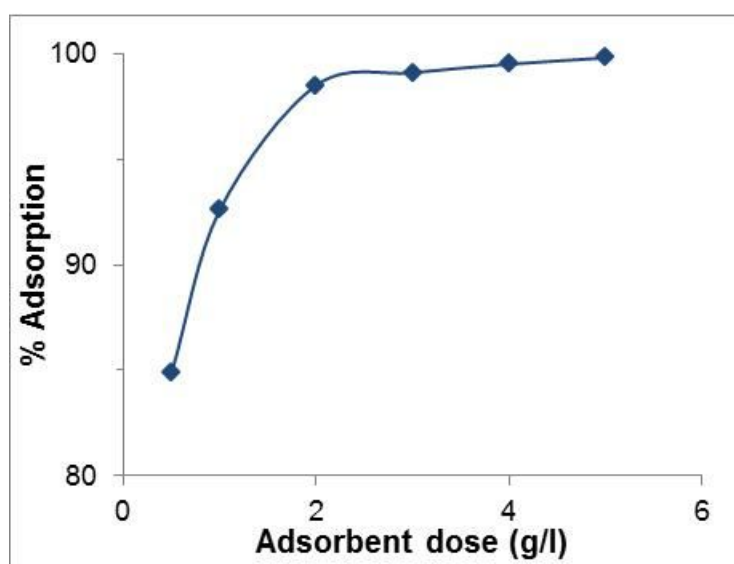


Figure S9. Influence of LDH/PEG-15 dose on the AO-II adsorption in aqueous solution.