Title: Adsorption behavior of methylene blue on glycerol based carbon materials

Authors: Apurva A. Narvekar, J.B. Fernandes, S.G. Tilve

PII: S2213-3437(18)30088-5
DOI: https://doi.org/10.1016/j.jece.2018.02.016
Reference: JECE 2208

To appear in:

Received date: 24-10-2017
Revised date: 8-2-2018
Accepted date: 11-2-2018

Please cite this article as: Apurva A.Narvekar, J.B.Fernandes, S.G.Tilve, Adsorption behavior of methylene blue on glycerol based carbon materials, Journal of Environmental Chemical Engineering https://doi.org/10.1016/j.jece.2018.02.016

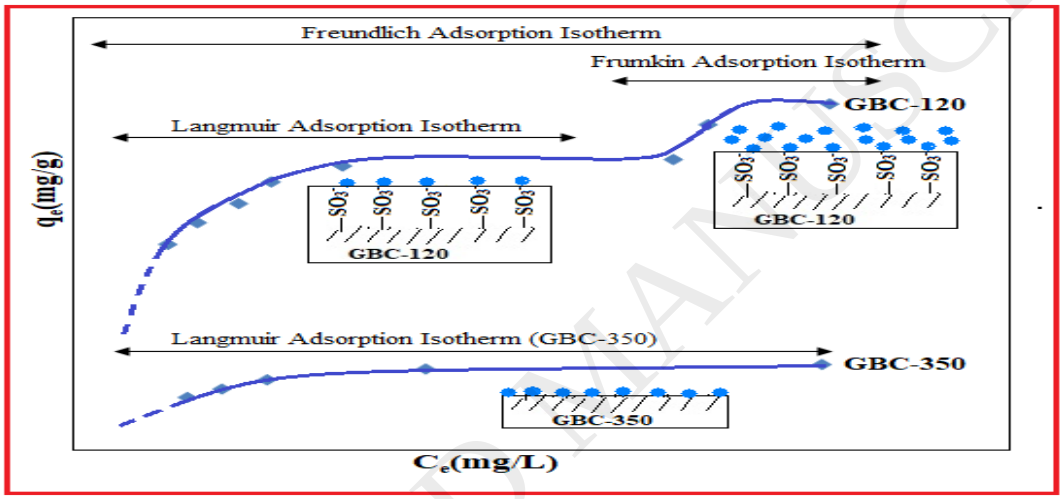
Adsorption behavior of methylene blue on glycerol based carbon materials

Apurva A. Narvekar, J.B. Fernandes*, S.G.Tilve

Department of Chemistry, Taleigao Plateau, Goa University, Goa – 403206, India.

Corresponding author e-mail address: jbfx@rediffmail.com

Graphical abstract



Highlights

- First report of methylene blue adsorption on glycerol based carbons.
- GBC-120 (SO_3H), surface area 21 m^2/g, multilayer adsorption capacity > 1000 mg/g
- GBC-350, 464 m^2/g, gave much lower adsorption ~ 130 mg/g, due to loss of SO_3H function.
- GBC-120 and GBC-350 followed second order adsorption kinetics.

Abstract

In the present investigation a glycerol based carbon was synthesized by partial carbonization of glycerol using concentrated H_2SO_4 in the molar ratio 1:4. The carbonized material was further treated at 120 ^oC and 350 ^oC to obtain the carbons GBC-120 and GBC-350 respectively. The samples were characterized by XRD, ir, thermal analysis (TG-DTG-DTA), pzc measurements; SEM and BET surface area analysis. The TGA showed a gradual weight loss up to about 800 ^oC. The adsorption studies were carried out using