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Title: Efficient removal of malachite green dye using biodegradable graft copolymer derived from amylopectin and poly (acrylic acid)

Author: Amit Kumar Sarkar Aniruddha Pal Soumitra Ghorai

N.R. Mandre Sagar Pal

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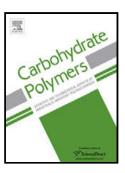
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ACCEPTED MANUSCRIPT

- 1 Efficient removal of malachite green dye using biodegradable graft copolymer derived from
- 2 amylopectin and poly (acrylic acid)
- 3 Amit Kumar Sarkar¹, Aniruddha Pal¹, Soumitra Ghorai¹, N. R. Mandre², Sagar Pal^{1*}
- ⁴ Polymer Chemistry Laboratory, Department of Applied Chemistry, Indian School of Mines,
- 5 Dhanbad- 826004, India.
- 6 ² Department of Fuel & Mineral Engineering, Indian School of Mines, Dhanbad 826004,
- 7 India.
- 8 Abstract:
- 9 This article reports the application of a high performance biodegradable adsorbent based on
- amylopectin and poly (acrylic acid) (AP-g-PAA) for removal of toxic malachite green dye
- 11 (MG) from aqueous solution. The graft copolymer has been synthesized and characterized
- 12 using various techniques, including FTIR spectroscopy, GPC analysis, SEM analysis, and XRD
- analysis. Biodegradation study suggests that the co-polymer is biodegradable in nature. The
- adsorbent shows excellent potential (Q_{max} , 352.11 mg g⁻¹; 99.05 % of MG has been removed
- within 30 min) for removal of MG from aqueous solution. It has been observed that point to
- 16 zero charge (pzc) of graft copolymer plays significant role in adsorption efficacy. The
- 17 adsorption kinetics and isotherm follow pseudo-second order and Langmuir isotherm models,
- 18 respectively. Thermodynamics parameters suggest that the process of dye uptake is
- 19 spontaneous. Finally desorption study shows excellent regeneration efficiency of adsorbent.
- 20 **Keywords:** Adsorption; poly (acrylic acid); graft copolymer; malachite green dye.
- 21 *Corresponding author: Tel: 91-326-2235769; Fax: 91-326-2296615
- 22 E-mail: sagarpal1@hotmail.com

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