

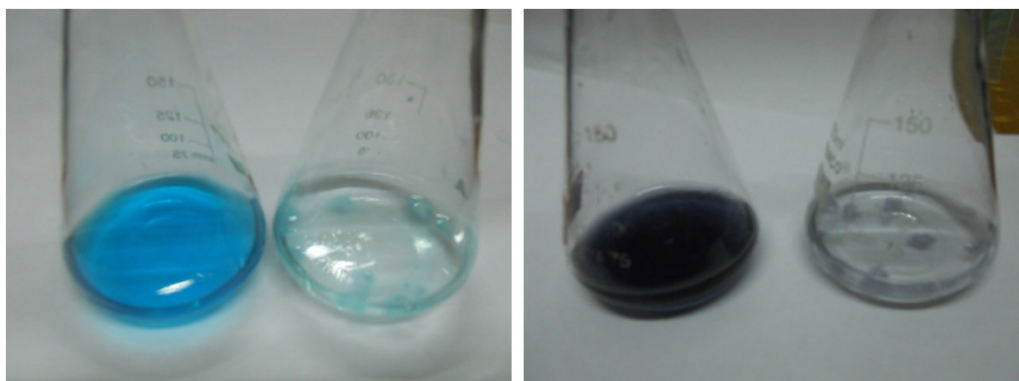
## HPMC-G-PAM: AN EFFICIENT ADSORBENT FOR REMOVAL OF REACTIVE DYES FROM AQUEOUS SOLUTION

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### ABSTRACT

Water pollution because of the indiscriminate disposal of toxic dyes from various industries has been a growing environmental problem. The present work highlights the feasibility of hydroxypropyl methyl cellulose grafted with polyacrylamide (HPMC-g-PAM) hydrogel towards its potential application as an efficient adsorbent for removal of both reactive blue and reactive black dyes from aqueous solution. The graft copolymer hydrogel has been developed by grafting synthetic polyacrylamide chains on HPMC backbone using conventional redox grafting method<sup>1</sup> as well as novel microwave assisted grafting method. The effect of various parameters on the efficacy and rate of dye adsorption on HPMC-g-PAM has been investigated and it has been observed that  $\text{pH}_{\text{pzc}}$  of hydrogel plays significant role on adsorption efficacy. The hydrogel not only shows significant high adsorption capacity but also exhibits excellent removal rate. The dye removal kinetics follows pseudo-second order and intraparticle diffusion model simultaneously. The adsorption equilibrium data correlates well with Langmuir isotherm model. The thermodynamic studies reveal that adsorption is endothermic and spontaneous in nature. Desorption studies confirm the efficient regeneration capacity of dye loaded hydrogel.



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### References:

Das, R; Panda, A. B.; Pal, S. *Cellulose* **2012**, *19*, 933.