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# GREEN POLYMERIC NANOMATERIALS FOR THE CATALYTIC REDUCTION OF DYE

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## INTRODUCTION

Nowadays, the treatment of industrial wastewater has become a challenging problem due to the lack of efficient device to separate toxic textile dyes from contaminated wastes. These dyes exert harmful effects on the living species in water as well as on the human beings **[1]** . Therefore, the removal of these dyes from different concentrations in the environment is extremely paramount of our present day society. Classical remediation methods based upon physicochemical reactions are costly and still generate sludges that contain amine residues. Nonetheless, recent research shows that nanomaterials containing biopolymers are promising to degrade organic pollutants by catalysis **[2, 3]**. Here, in this work the synthesis and applications of biopolymeric nanomaterials for catalytic reduction of MB dye has been used to degrade the organic pollutants. For better reusability and stability, we have focused on the preparation of composite beads based on biopolymers alginate containing metal oxide ($CeO_2$) as active sites. Ce(III) was used as a cross linking agent and then was modified with a base to transform it to $CeO_2$ encapsulated in the alginate matrix. To study the catalytic behavior of this material the reduction of Methylene Bleu (MB) dye in the presence of $NaBH_4$ was selected as a model reaction . These composites beads $CeO_2$@Alginate are characterized by XRD, SEM .

## REFERENCES

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## RESULTS AND DISCUSSION

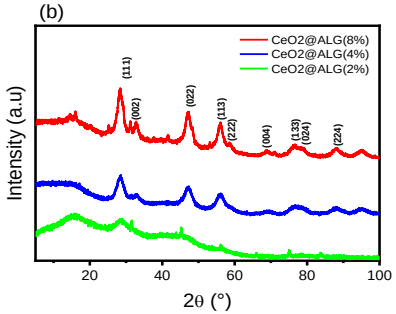


**Figure 1:** XRD patterns of composite beads

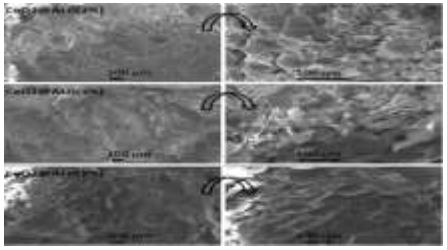

**Figure 2:** SEM images composites beads

### Catalytic test

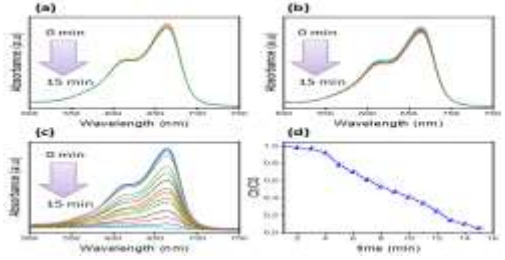


**Figure 3:** UV–vis spectra of MB dye (a–c), (a) adsorption test without NaBH4, (b) blank test, (c) catalytic test in the presence of NaBH4 and CeO2@ALG(2%) catalyst (Conditions: pH = 6.5, [MB] = 0.6 mM, [NaBH4] = 0.1 M, catalyst mass 4 mg, *T = ambient temperature). (d) The plot of Ct/C0 as a function of reaction time*