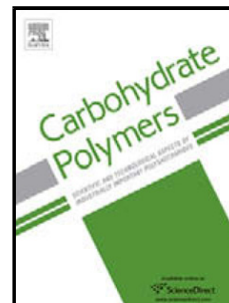


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## Preparation of Porous 2,3-dialdehyde Cellulose Beads Crosslinked with Chitosan and their Application in Adsorption of Congo Red Dye

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### Highlights

- Efficient method for crosslinking DAC beads with chitosan
- Highly porous beads with high specific surface area produced
- Beads stable at highly alkaline conditions
- High adsorption capacity for Congo red dye

### Abstract

Micrometer sized 2,3-dialdehyde cellulose (DAC) beads were produced via a recently developed method relying on periodate oxidation of *Cladophora* nanocellulose. The produced dialdehyde groups and pristine hydroxyl groups provided the DAC beads with a vast potential for further functionalization. The sensitivity of the DAC beads to alkaline conditions, however, limits their possible functionalization and applications. Hence, alkaline-stable and porous cellulose beads were prepared via a reductive amination crosslinking reaction between 2,3-dialdehyde cellulose beads and chitosan. The produced materials were thoroughly characterized with different methods. The reaction conditions, including the amount of chitosan used, conditions for reductive amination, reaction temperature and time, were investigated and the maintained morphology of the beads after exposure to 1 M NaOH (aq.) was verified with SEM. Different washing and drying procedures were used and the results

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