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Cellulose: A review as natural, modified and activated carbon adsorbentSUHAS^{1*}, V.K. GUPTA², P.J.M. CARROTT³, RANDHIR SINGH¹, MONIKACHAUDHARY¹ AND SARITA KUSHWAHA¹¹*Department of Chemistry, Gurukula Kangri Vishwavidyalaya, Haridwar – 249404, India*²*Department of Applied Chemistry, University of Johannesburg, Johannesburg, South Africa*³*Centro de Química de Évora and Departamento de Química, Universidade de Évora, Colégio Luís António Verney, 7000-671 Évora, Portugal***Abstract**

Cellulose is a biodegradable, renewable, non-meltable polymer which is insoluble in most solvents due to hydrogen bonding and crystallinity. Natural cellulose shows lower adsorption capacity as compared to modified cellulose and its capacity can be enhanced by modification usually by chemicals. This review focuses on the utilization of cellulose as an adsorbent in natural/modified form or as a precursor for activated carbon (AC) for adsorbing substances from water. The literature revealed that cellulose can be a promising precursor for production of activated carbon with appreciable surface area ($\sim 1300 \text{ m}^2\text{g}^{-1}$) and total pore volume ($\sim 0.6 \text{ cm}^3\text{g}^{-1}$) and the surface area and pore volume varies with the cellulose content. Finally, the purpose of review is to report a few controversies and unresolved questions concerning the preparation/properties of ACs from cellulose and to make aware to readers that there is still considerable scope for future development, characterization and utilization of ACs from cellulose.

Keywords: Activated carbon, adsorbent, adsorption, cellulose, lignocellulosic

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