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## Oxygen enriched network-type carbon spheres for multipurpose water purification applications

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### ABSTRACT

Potassium hydroxide (KOH) modified network-type carbon spheres (CSs) with abundant oxygen-rich groups were synthesized using a simple hydrothermal carbonization (HTC) of glucose precursor and utilized for the adsorptive removal of cadmium(II) heavy metal and congo red (CR) dye as well as photocatalytic degradation of CR. Characterizations on the samples using SEM, FT-IR, TGA, XPS and BET surface area confirmed the presence of porous activated CSs with large surface area of 1125.91 m<sup>2</sup>. Adsorbent with KOH to CS ratio of 1:1 exhibited maximum adsorption capacities of 276.09 and 382.15 mg/g for Cd(II) and CR respectively. Adsorption data corroborated well with Freundlich isotherm revealing that the multi-layer sorption was predominant. Pseudo-second-order kinetics model described the adsorption process well implying chemisorption was the major contributor for the adsorption

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