Title

Black gram husk-derived carbon dots: characterization and catalytic dye reduction activities

Abstract

Herein, we demonstrated an easy hydrothermal carbonization route to prepare fluorescent carbon dots by utilizing black gram husk (BGH) as a carbon source. The formation of black gram husk-derived carbon dots (BGH-CDs) was confirmed by ultraviolet–visible spectroscopy and high-resolution transmission electron microscopy. The presence of functional groups in BGH-CDs was explored by Fourier transform infrared spectroscopy. The fluorescence behavior of BGH-CDs was identified by fluorescence spectroscopy. At the optimized condition, BGH-CDs exhibited greater catalytic performance in the reduction (or decolorization) of methylene blue and carmoisine dyes with a removal efficiency of 99.5 and 97.5% within 4 and 6 min respectively. The prepared BGH-CDs could become a high-performance catalyst in the reduction of water pollutants. Graphical Abstract: [Figure not available: see fulltext.].

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