Yellow-Emissive Carbon Dots as a Fluorescent Probe for Chromium(VI)

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Abstract:

The authors describe a one-step method for the preparation of yellow fluorescent carbon dots (CDs) starting from 4-aminoacetanilide hydrochloride and 4-acetamidobenzaldehyde. The CDs have excitation/emission peaks at 470/550 nm, good water solubility, salt-tolerance and photostability. Their fluorescence is quenched by hexavalent chromium [Cr(VI)] via static quenching. Fluorescence intensity drops linearly in the 1 to 400 μM Cr(VI) concentration range, and the limit of detection is 0.13 μM. This method is selective for Cr(VI) over potential metal ion interferences and was successfully applied to the detection of Cr(VI) in spiked water and biological tissue samples. Recoveries from spiked samples ranged from 97.7% to 103.8%.