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PAPER SLUDGE DERIVED NITROGEN-DOPED POROUS CARBON FOR EFFICIENT HEXAVALENT CHROMIUM ADSORPTION

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Abstract:

Paper sludge has been converted to activated carbon, however the adsorption capacity is still limited. We herein present a facile ethylenediamine dihydrochloride assisted activation of paper sludge in producing nitrogen-doped porous carbon adsorbent for hexavalent chromium removal. The characterization results have categorically confirmed the addition of ethylenediamine dihydrochloride effectively introduces nitrogen dopant and enlarges specific surface area. The best-performing nitrogen-doped porous carbon adsorbent endows with a large specific surface area (1244 m^2/g) and high Cr(VI) adsorption capacity (193.6 mg/g). The adsorption experiment verifies a spontaneous endothermic chemisorption process with pseudo-second-order kinetic, consistent with a Langmuir model. Further X-ray photoelectron spectroscopy (XPS) results indicate a reductive Cr(VI) adsorption onto the nitrogen-containing functional groups on the nitrogen-doped porous carbon. The present work exemplifies a chemical assist activation of paper sludge into high performance porous carbon adsorbent for hazardous metal removal.

AN POSSIBLE MECHANISM OF THE AGGREGATION-INDUCED EMISSION IN COUMARINS COMPOUNDS

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The most organic chromophores with highly fluorescent in solution at low concentration shows a sharp decrease in their emission efficiency in the solid state. This behavior is usually associated with intermolecular interactions, which provide ways for the nonradiative decay of the electronic excitation energy. A new