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ADSORPTION OF HEAVY METAL IONS IN TATTOOS INK BY MODIFIED BENTONITE CLAY

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Aim: The aim of this study is adsorption of a heavy metal ion, Cu(II), from aqueous solution by using a new modified bentonite clay.

Methods: Acrylamide, bisacrylamide, bentonite, and L-histidine in the presence of an initiator (azobisisobutyronitrile, AIBN) were mixed and bentonite-acrylamide-histidine (BABH) microcomposites were prepared by bulk polymerization. Characterization studies were performed by SEM, FT-IR, XRD, and BET.

Loading of Cu(II) ions was carried out in a batch system. 100 mL of aqueous solution containing Cu(II) ions (between 10-1000 ppm) was treated with the polymer beads. Investigations were made at pH values between 4.0 and 8.0 and at different temperatures. The amount of the binding Cu(II) was determined by atomic adsorption spectrometer.

Results: Specific surface area of the bentonite and BABH microcomposite was found to be 33.4 and 1.42 m^2/g, respectively.

Cu(II) ions (20 μmol/g) were chelated on these bentonite-acrylamide-histidine (50 μmol/g L-histidine incorporation) microcomposites at pH 5.0 at room temperature. Present your results in a logical sequence in text, table and illustrations.

Conclusions: Bentonite clay has got amazing properties such as absorption of dirt from the skin. One of the dirt is heavy metals include Cd(II), Zn(II), Ni(II), Cr(II), Co(II) and Cu(II) which comes from ink. This newly synthesized bentonite has got stronger adsorption features because of its expanded properties and new functional groups such as histidin. L-histidine is one of the strongest metal coordinating ligands. L-histidine increased the polarity of adsorbency and this caused facilitation adsorptions of both of organic and inorganic substances. It could be an attractive tool for removal of heavy metal ions in the future for dermatologists.