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HEMP DECONTAMINATION OF POLY-METALLIC AQUEOUS SOLUTIONS

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Abstract

This study investigates the adsorption of several metals in aqueous solution, by hemp materials (loose fibre and felted fibre). After characterization of the fibre, an extensive study was conducted on the adsorption properties of this material. The experiments were carried out in poly-metallic aqueous solutions containing Al, Co, Cr, Cu, Ni and Zn at a concentration of 1 mg L⁻¹ and 10 mg L⁻¹ each. The pH effect was found to lead to an optimum between pH 4 and 4.5. The kinetics of the adsorption reaction of the material was followed, and equilibrium was found to be reached after 30 min. A dose study determined maximum removal efficiency with 10 g fibre L⁻¹. Finally, the adsorption of loose hemp fibre and felt were compared using the materials either raw, previously washed with water or with a sodium bicarbonate solution. Adsorption was better with felt than with loose fibre, both when the materials were in their raw state and when they had been previously washed with water. Similar results were obtained for loose or felted materials after NaHCO₃ washing, showing up to 99% removal efficiency for some metals.

Key words: adsorption, batch, felt, fibre, hemp, metals

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