

Biosorption of radiotoxic ^{90}Sr by green adsorbent: dry cow dung powder

by Barot, Nisha S.; Bagla, Hemlata (Nuclear and Radiochemistry Department, Kishinchand Chellaram College, Mumbai (India)), E-mail: hemabagla@gmail.com

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[en] The threat of water famine looms greatest as our water bodies are poisoned due to toxic heavy metals, organometalloids and radionuclides. Strontium is a health hazard only if it is taken into the body as it has relatively long physical half-life i.e. 29 years. It enters our body through food, water and soil. To find sustainable solution for the same, globally, we have embraced Green chemistry approach of Biosorption. In the present investigation, we have employed Dry Cow Dung powder (DCP) as an Eco-friendly resin. It is enriched with 'Humic acid'. We have successfully extracted Humic Acid (HA) from DCP and this piece of work is published in the international journal. For the functional group analysis different spectroscopic studies using FTIR, NMR, RAMAN, Photoluminescence and ESR spectroscopy is employed. The FTIR studies of DCP before and after adsorption confirmed the biosorption process. In this studies, we have carried out the Batch Equilibration Experiments, employing radiotracer at the room temperature and pressure for the removal of ^{90}Sr (^{90}Y was removed by precipitating $^{90}\text{Y}(\text{III})$ as its hydroxide). We are also carrying out the studies for the adsorption of ^{90}Y as an ingrowth, if possible. The influence of different experimental parameters such as pH (varied from 1-10), initial metal ion concentration (0.5-20 mg/mL), contact time (0-30 min), agitation speed (0-5000 rpm), amount of adsorbent (50-1000 mg), temperature (273-373 K) and interference of different organic as well as inorganic salts were studied so as to optimize the parameters for developing efficient adsorption process

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