

Co and Cs removal from soil using bioreactor with sulfur-oxidizing bacteria bead

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The sulfur-oxidizing bacteria (SOB) immobilized gel beads were prepared using sodium alginate (SA) and polyvinyl alcohol (PVA) to select a suitable polymeric carrier for the bioleaching of Co in soil. Cultivation of the SOB beads was carried out in modified medium 125 solutions with air injection (100 mL/min) at 30°C for 36 days. Variation of pH and SO_4^{2-} concentration in culture medium was measured during the SOB bead cultivation. In addition, microbial growth in the beads was analyzed using HR-CLSM. The SOB bead cultivation and leaching columns was connected to establish the bioreactor. The influent and air were injected into the column in an upward direction at the mean rate of 0.21 mL/min and 300 cc/min, respectively. The effluent was collected periodically for 140 days to analyzed for pH, SO_4^{2-} , and Co concentration after filtration using 0.2 μm filter.