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## **SILICA IMPREGNATED WITH CYPHOS IL-101 FOR Cs<sup>+</sup> ADSORPTION**

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### **Abstract**

A series of experiments were performed to quantify the adsorption of Cesium on Silica impregnated with trihexyl(tetradecyl)phosphonium chloride (Cyphos IL-101). Non-radioactive cesium solution was used as a surrogate of the radioactive <sup>137</sup>Cs. The obtained impregnated Silica with the studied ionic liquid was characterized through scanning electron microscopy, energy dispersive X-ray analysis and Fourier transform infrared spectroscopy in order to put in evidence that the impregnation with the ionic liquid occurred. The adsorption process has been investigated as a function of pH, solid:liquid ratio, adsorbate concentration, contact time and temperature. Three kinetic and two equilibrium models were employed to interpret the test results. The results indicate that the adsorption fitted well with the pseudo-second order kinetic model. Simple thermodynamic model has been applied to the isotherm sorption data and the relevant thermodynamic parameters were determined from the graphical representation of this model. The isotherm data was well described by Langmuir isotherm model. The reported results showed that the impregnated silica with Cyphos – IL 101 studied in this paper is an efficient adsorbent material for the removal of cesium ions from aqueous and wastewater solutions.

*Key words:* Cs<sup>+</sup> adsorption, ionic liquid, impregnation, silica,

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