

## **SOLVENT EXTRACTION OF SOME METAL IONS BY DITHIOCARBAMATE TYPES OF CHEMICALLY MODIFIED LYPOPHILIC CHITOSAN**

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Chitosan is a basic polysaccharide containing primary amino groups with high reactivity. Although it exhibits good adsorption behaviours for some metal ions by itself owing to the primary amino groups, it is able to be much improved by immobilizing some functional groups with high selectivity to some specified metal ions on polymer matrices of chitosan by simple chemical modification. Further, although chitosan itself or chemically modified chitosan are hydrophilic powder materials suitable for adsorption from aqueous solutions owing their hydroxyl groups, they are able to be converted into lypophilic materials soluble in some organic diluents such as chloroform, toluene, xylene or kerosene suitable for solvent extraction by acylating their hydroxyl groups with long chain alkyl radicals.

Based on the above-described concept, we prepared O,O'-decanoyl chitosan and dithiocarbamate O,O'-decanoyl chitosan; the former was soluble in chloroform and toluene, while latter was soluble not only these diluents but also in some aliphatic diluents such as hexane and kerosene which are employed in commercial scale solvent extraction.

Solvent extraction by dithiocarbamate O,O'-decanoyl chitosan in kerosene was tested for some base metal ions from sulfuric acid solution. The sequence of selectivity for these metal ions was found to be as follows: Cu(II) >> Ni(II) > Cd(II) ~ Fe(III) > Co(II) ~ Zn(II). Copper(II) was quantitatively extracted at pH > 1 and quantitatively stripped with 2 M sulfuric acid solution.

Solvent extraction of silver(I) and gold(III) from hydrochloric acid as well as lanthanides and americium(III) from nitrate solution were also tested. Americium was selectively extracted over trivalent lanthanides, suggesting a high possibility for the final treatment of high level radioactive wastes.



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