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DESIGN OF ION-EXCHANGE RESINS THROUGH EDTA AND DTPA MODIFIED LIGANDS

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Abstract. Extraction of specific targeted species (rare earth, heavy metals, transition metals, radionuclides) from industrial and nuclear effluents is an important issue in the recycling and / or decontamination process**.** Selective complexation and ion exchange of a targeted metal ion are mainly based on liquid/liquid extraction, solid/liquid extraction, association nanofiltration / complexation, and ion-exchange processes.

Selective complexation and ion exchange for the removal and recovery of a targeted metal ion by a given polymeric reagent is an important objective for many applications such as water treatment. Ion-exchange resins have a wide application in industry and in environmental remediation, Cation-exchange resins have a wide application in industry and in environmental remediation but commercially available cation-exchange resins (with carboxylic acid, sulfonic acid, or phosphonic acid groups) usually provide only poor differentiation of a given ion from ions with the same charge.

Separation procedures employing such resins are frequently made more selective by the addition of complexing agents during sorption or elution.

Metal-specific ligands incorporate in the structure of the resin itself is an interesting way to perform ion separation taking the advantage of the selectivity of chelating agents.

Catechol, resorcinol, and their admixtures with EDTA and DTPA moieties were converted into polymeric resins by alkaline polycondensation with formaldehyde. The resins were characterized by FTIR spectroscopy, elemental analysis, ion-exchange capacity, and distribution coefficient (*D*) for heavy metal and radionuclide such as Cs and Sr. ^{137}Cs and ^{90}Sr constitutes a major source of heat in nuclear waste streams and in regards to recent nuclear event their remediation in complex solution – sea water - represent an important issue.