

SYNERGISTIC EXTRACTION OF SODIUM AND POTASSIUM PICRATES WITH MIXTURE OF C-METHYL CALIX[4]RESORCINARENE AND 4'-AMINO-BENZO-15-CROWN-5

VERZIU Cezar

Universitatea Politehnica Bucuresti, Polizu Street,1, Bucuresti, Romania

Reviewer: SERBAN Bogdan-Catalin, PhD, Research Scientist

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This paper presents extraction behaviour of sodium and potassium picrates from aqueous phase to an organic phase (chloroform) using three types of extractants: 4'-aminobenzo-15-crown-5 (fig.1) C-methyl calix[4]resorcinarene(fig.2), and an equimolecular mixture of both supramolecular compounds. Variation of concentration of extractants in aqueous phase was also examined. The concentrations of sodium and potassium cations from chloroform solution were determined by the concentrations of picrates from aqueous phase. All macrocyclic ligands show a moderate affinity for sodium and potassium cations. The extractability is given by equation:

$$\%E = [M]_{\text{org}}^+ / [M]_{\text{aq. initial}}^+ \cdot 100$$

The percent of extractability can be determined from the absorbance spectra according to equation:

$$\%E = A_i - A_f / A_i \cdot 100$$

For all examined concentrations, C-methyl calix[4]resorcinarene exhibit a poor extractability for both cations. For equimolecular mixture of extractants it was found a synergistic extraction :

$$\%E_{\text{calixarene}} + \%E_{\text{crown-ether}} < \%E_{\text{calixarene-crown ether mixture}}$$

In the extraction process, 4'-aminobenzo-15-crown-5 forms charged complex with cations, and then associate with C-methyl calix[4]resorcinarene through π - π stacking interactions and hydrogen bonds.

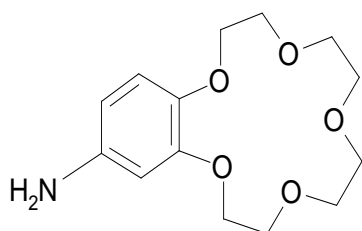


Fig.1 The structure of 4'-amino-benzo-15-crown-5

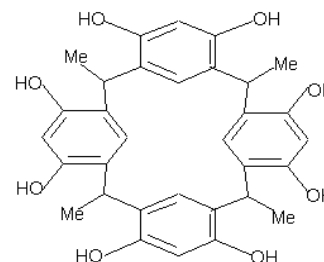


Fig.2 The structure of C-methyl calix[4]resorcinarene

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