

Analytical Application of Thiazole-Azo-Calix-[4]-Resorcinarene

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ABSTRACT:

Some heavy metal ions such as Pb^{2+} , Hg^{2+} , Cd^{2+} , etc., have been contaminating consumable water since industrialization has raised its hood. The detection of these ions is an indispensable affair. The presence of these ions have affected many lives gravely. The whole purpose of the research was to synthesize, characterize, and study the analytical application: metal ion encapsulation property of the 2-amino thiazole derivative of calix[4]resorcinarene. The first step dealt with the preparation of calix-[4]-resorcinarene from resorcinarene and acetaldehyde in acidic medium. The next step was reaction of calix-[4]-resorcinarene with 2-amino thiazole to form thiazole-azo-calix-[4]-resorcinarene. This product was first spectroscopically analyzed and then its metal ion encapsulation properties were studied. It was found that it complexes with Pb^{2+} , Hg^{2+} ions giving a sharp color change. Further work was done with lead ions. Various dilutions of these ions were prepared. This was found effective to detect lead ions in as low as 10ppm. Total permissible lead content in water is 15ppm. This work will be pioneer for further studies which want to detect heavy metal ions in low concentrations. The reactions and synthesis were carried out in laboratory without much complications or costly chemicals. This has to be one of the best ways for analysis of lead ions.

Keywords: resorcinarene, acetaldehyde, 2-amino-thiazole, encapsulation