



Short Communication

Liquid liquid Extraction of Cd^{2+} and its Complexation study by p-t-butyl thiacalix (4) arene

Santosh M. Chavhan¹, Nilesh V. Rathod^{2*}, Madhuri S. Kulkarni², Arun B. Patil¹ and Dipalee D. Malkhede³

¹Department of Chemistry P. N. College Pusad, Yawatmal, Maharashtra, India

²Department of Chemistry Modern College, Ganeshkhind, Pune, Maharashtra, India

³Department of Chemistry Savitribai Phule Pune University Pune 411007, Maharashtra, India
nileshrathod3684@gmail.com

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Abstract

In the present study the extraction of Cd^{2+} with thiacalixarene from acidic medium studied. The cadmium successfully extracted about 92% and determine with PAR at 520 nm. The effect of acid molarity of 0.1M, 1:5 metal to ligand molar ratio found efficient for maximum extraction. The stoichiometry ratio 1:2 between metal to ligand is established.

Keywords: Liquid, Extraction, Complexation study.

Introduction

The study of heavy metal is important due to their elimination from industrial wastes. Cd^{2+} is one of the well known heavy metal ion and associated with severe diseases. A long exposure of cadmium can affects the kidney, liver bone and blood¹. Solvent extraction is a technique has been used for many years for the separation of metal ions by many researchers. Cadmium have been extracted by using organophosphorous, alkyl xanthates, TOPO and DEHPA as a extracting ligands²⁻⁴. Thiacalixarene is a supramolecular compound and in which the bridging $-CH_2$ of calixarene is replaced by sulphur group. In order to understand the complexing nature of thiacalixarene, is used to extraction of cadmium in present study.

Methodology

A stock solution of 250 μ M of cadmium nitrate was prepared in 0.1 M HNO_3 . 1250 μ M of thiacalixarene was prepared in chloroform solution. The 4-(2-Pyridylazo) resorcinol (PAR) was prepared by dissolving 0.100 gram in 100 mL of distilled water. 2mL of metal and ligand were mixed in a beaker and stirred for 30 min and then allow to settled in separating funnel for 20 min.

Results and Discussion

The results obtained for the use of nitric acid molarity on extraction of cadmium as shown in Figure-1. Acid molarity was carried out at different concentration and 0.1M acid molarity gives the maximum extraction. The metal to ligand molar ratio study (Figure-2) was carried out to understand the amount of ligand and at 1:5 molar ratio highest parentage of extraction of cadmium could be obtained. In order to know the stoichiometry between metal and ligand slope ratio method is used to calculate

and it is found that metal binds with two ligands.

Conclusion

The method described the potential of thiacalixarene for extraction of cadmium from nitric acid medium. Nitric acid molarity of 0.1M found to be efficient extraction condition to obtained 92% extraction of cadmium. The metal to lagand ratio 1:5 was efficient condition for efficient extraction of cadmium.

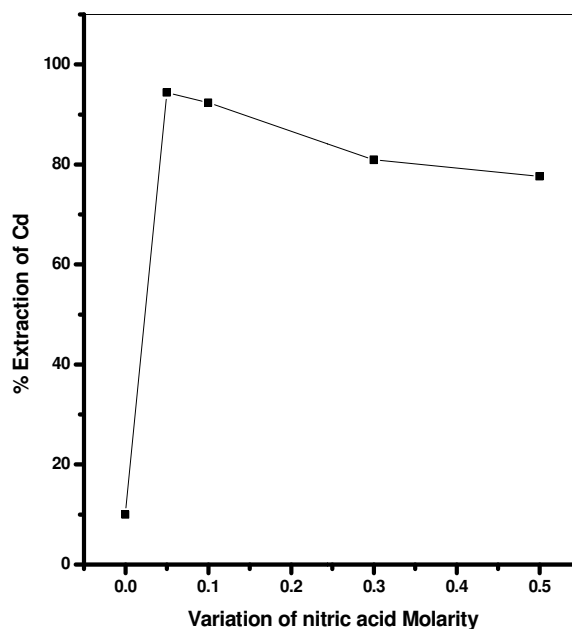


Figure-1
Variation in nitric acid molarity

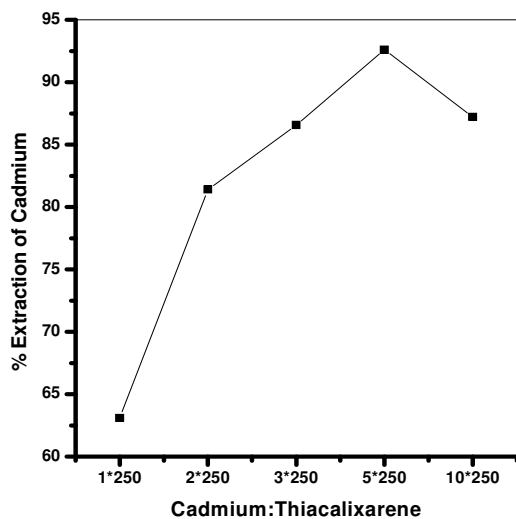


Figure-2
Metal to ligand molar ratio

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