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## **TRANSPORT STUDY OF MOLYBDENUM THROUGH A BULK LIQUID MEMBRANE USING DI-(2-ETHYLHEXYL) PHOSPHORIC ACID AS CARRIER**

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**Abstract:** The transport of Mo(VI) through a chloroform bulk liquid membrane containing Di-(2-ethylhexyl) phosphoric acid (DEHPA) as a carrier was studied. Using 3 M HNO<sub>3</sub> in the receiving phase, the amount of molybdenum transported across the liquid membrane, after 4 h, was 94.2%. The selectivity and efficiency of molybdenum transport from aqueous solution containing a competing ion was investigated.

**Keywords:** Liquid membrane transport, Molybdenum(VI), Di-(2-ethylhexyl) phosphoric acid.

### **1. INTRODUCTION**

Selective separation of a given metal ion from a complex mixture of other ionic species is of increasing importance in industrial and analytical chemistry and separation sciences. In most cases, various interfering species must be removed and/or the species of interest must be enriched before detection. Carrier mediated transport through liquid membrane is well known as one of the most powerful tools for such concentration, separation and recovery processes [1-4]. An important advantage for the use of this procedure is that in the liquid membrane technology, the extraction, stripping and regeneration operations are combined in one single step.

Proton-driven cation transport through a liquid membrane containing an ion-selective ionophore bearing a proton-dissociable moiety is one of the most effective separation techniques for a particular metal ion [5-9]. In this membrane cation transport system, there is often no need for the counter anion to counterbalance the positive charge because the proton-dissociated ionophore itself can act as the counter anion of the complexing cation. Therefore, cation transport ability is independent of the extent of hydration of a counter anion. The uphill transport against a cation concentration gradient is also feasible since cations are transferred by counter transport of protons.

In the present paper, selective transport of Mo(IV) through a chloroform bulk liquid membrane containing Di-(2-ethylhexyl) phosphoric acid (DEHPA) was studied. Different experimental parameters, e.g. pH, the effects of DEHPA concentration in the membrane, type and concentration of acids in receiving phases on molybdenum transport were investigated.

### **2. EXPERIMENTAL OBSERVATIONS**

#### **2.1. Instrumentation**

All the measurements were carried out using a Perkin Elmer (Optima 7300 DV) simultaneous ICP-OES coupled to a concentric nebulizer and equipped with a charge coupled device (CCD) detector. A Metrohm model 744 digital pH meter, equipped with a combined glass-calomel electrode, was employed for the pH adjustments.

#### **2.2. Reagents**

All reagents used were of analytical grade and were used as supplied. Chloroform (Merck) was of extra pure grade and used as received. DEHPA was obtained from Sigma-Aldrich. Standard stock solution (1000 µg mL<sup>-1</sup>) of Mo(VI) was prepared by