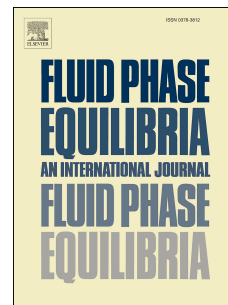


Accepted Manuscript

Thermodynamic modeling of the solvent extraction equilibrium for the recovery of vanadium (V) from acidic sulfate solutions using Di-(2-ethylhexyl) phosphoric acid

Seyed Mohammad Razavi, Ali Haghtalab, Ali Reza Khanchi



PII: S0378-3812(18)30271-1

DOI: [10.1016/j.fluid.2018.07.007](https://doi.org/10.1016/j.fluid.2018.07.007)

Reference: FLUID 11884

To appear in: *Fluid Phase Equilibria*

Received Date: 2 June 2018

Revised Date: 3 July 2018

Accepted Date: 5 July 2018

Please cite this article as: S.M. Razavi, A. Haghtalab, A.R. Khanchi, Thermodynamic modeling of the solvent extraction equilibrium for the recovery of vanadium (V) from acidic sulfate solutions using Di-(2-ethylhexyl) phosphoric acid, *Fluid Phase Equilibria* (2018), doi: 10.1016/j.fluid.2018.07.007.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Thermodynamic modeling of the solvent extraction equilibrium for the recovery of vanadium (V) from acidic sulfate solutions using Di-(2-ethylhexyl) phosphoric acid

Seyed Mohammad Razavi^a, Ali Haghtalab^{a,}, Ali Reza Khanchi^b*

^aDepartment of Chemical Engineering, Tarbiat Modares University, P.O. Box 14115-143,
Tehran, Iran

^bMaterials and Nuclear Fuel Research School, Nuclear Science and Technology Research
Institute, P.O. Box 11365-8486, Tehran, Iran

Abstract

A study of the reaction mechanism and thermodynamic modeling of pentavalent vanadium V(V) extraction from $\text{NaVO}_3\text{-H}_2\text{SO}_4\text{-H}_2\text{O}$ solutions using Di-(2-ethylhexyl) phosphoric acid (D2EHPA or HA) extractant was carried out. The effects of initial pH of the solution, extractant concentration, and temperature on the extraction of V(V) were examined. The stoichiometry of the extraction reaction was determined using the slope analysis method. The extracted species was shown to be VO_2A . A thermodynamic modeling approach was proposed for the prediction of equilibrium concentrations and pH of the system based on the known initial concentrations and process temperature. In the presented approach, the non-ideality of both aqueous and organic phases was taken into account. The activity coefficients of all organic components were calculated using UNIQUAC-NRF model, while the Electrolyte-UNIQUAC-NRF model was employed to calculate the activity coefficients of ions in aqueous phase. The equilibrium constant of the extraction reaction and the unknown parameters of the models were adjusted

* Corresponding Author: E-mail address: haghtala@modares.ac.ir (A. Haghtalab).

Download English Version:

<https://daneshyari.com/en/article/6619039>

Download Persian Version:

<https://daneshyari.com/article/6619039>

[Daneshyari.com](https://daneshyari.com)