

**KINETIKA DAN SELEKTIFITAS SISTEM
TRANSPOR Cu(II) ANTAR FASA
MELALUI TEKNIK MEMBRAN CAIR
FASA RUAH
DENGAN MENGGUNAKAN OKSIN
SEBAGAI ZAT PEMBAWA**

Refinel, Zaharismi, Olly Norita Tetra
Jurusan Kimia, FMIPA, Universitas Andalas
Padang
email : refinel@yahoo.com

ABSTRACT

The effect of addition oleat acid 1.575×10^{-4} M into membrane phase had been employed at the optimum condition of Cu(II) transport by the composition Cu(II) 3.15×10^{-4} M as source phase with pH 3, oxine 17.5×10^{-4} M dissolved into chloroform as membrane phase, H_2SO_4 0.15 M as receiving phase, stirring rate was 340 rpm. The result of the research showed increase in effectivity of transport Cu(II) interphase from 6 hours to 3 hours with the rate constants into membrane phase extraction (k_1) $0.0454 \text{ minute}^{-1}$, the stripping (k_2) $0.0364 \text{ minute}^{-1}$ at the temperature of 301°K and activation energy (E_a) 51.147 KJ/mol . The reaction was identified by means of kinetic model involving two consecutive irreversible first order. The selectivity of Cu(II) transport system analyzed to mixed Cu(II) ion with Cd(II), Co(II), Ni(II), Mg(II), Ca(II) and Sr(II) ions in pairing system or totally system in 1 : 1 comparison. The measurement was performed to each ions that was transported receiving phase and the remains in resource phase by using SSA model Alfa-4. The result of research showed that Cu(II) was selective enough transported.

Keywords: Kinetic transportation, Cu(II) ions, oxine, oleat acid, selectivity

DAFTAR PUSTAKA

1. M. Mulder, *Basic Principle of Membrane Technology*, Kluwer Academic Publisher, Dordrecht, 1991, 244 – 259.
2. Stary, *J. Anal. Chem. Ac.* 28: 132 – 149, (1963).
3. H.K. Alpoguz, A. Kaya, M. Karakus, Mechanism and Kinetics of Copper(II) Transport Through a Liquid Membrane Containing a Dithiophosphonate Derivative as Carrier, *Turk. J. Chem.*, 29: 345-353, (2005).
4. F. Khalil and M. Shamsipur, Separation Study of Cadmium as CdI_4^{2-} Through a Bulk Liquid Membrane Containing Ketoconazole and Oleic Acid, *Anal. Sci.*, 21: 501-505, (2005).
5. G. Leon, Facilitated Transport of Cobalt (II) Through Bulk Liquid Membranes Containing Diethylhexyl Phosphoric Acid, *Desalination*, 162: 211-215, (2004).
6. M.D. Granado-Castro, M. D. Galindo-Riano, M Garcia-Vargas, Model Experiments to Test The Use of a Liquid Membrane For Separation and Preconcentration of Copper From Natural Water, *Analytica Chimica Acta*, 506: 81-86, (2004).
7. H. Korkmaz, Ahmet and Mehmet, Mechanism and Kinetics of Cu(II) Transport Through a Liquid Membrane Containing a Dithiophosphonate Derivative as Carrier, *Turk. J. Chem.*, 29: 345 – 353, (2005).
8. O. Norita, A. Alif, H. Aziz dan Emriadi. *Transpor Antar Fasa dari Ion Tembaga (II) Melalui Membran Cair Fasa Ruah*, Program Pascasarjana, Universitas Andalas, Padang, 2001, 14-34.
9. A. Safavi, and E. Shams, Selective and Efficient Transport of Hg(II) Through Bulk Membrane Using Methyl Red as Carrier. *J. Membr. Sci.*, 144: 37 – 43, (1998).
10. Z. Kahar, Mempelajari Peranan Oksin sebagai Zat Pembawa Co(II) Antar Fasa (air-kloroform-air) Melalui Teknik Membran Cair Fasa Ruah, *Jurnal Kimia Andalas*, 8(2): 29-33, (2002).
11. Z. Kahar, A. Alif, H. Aziz dan Emriadi, Pengaruh ion Fe(III), Ni(II), Cu(II) Terhadap Transpor Co(II) Antar Fasa (air-kloroform-air) Melalui Teknik Membran Cair Fasa Ruah, *Jurnal Kimia Andalas*, 8(1): 29-33, (2002).
12. Refinel, Z. Kahar dan Y. Sahirra, Pengaruh konsentrasi ion Ca(II), Mg(II) dan Sr(II) Terhadap Optimasi Transpor Cd(II) Dengan Zat Pembawa Oksin Melalui

- Membran Cair Fasa Ruah, *Jurnal Kimia Andalas*. 11(2): 16-22, (2005).
13. Shertin, *Kinetika Transpor Cu(II) dengan Zat Pembawa Oksin dan Asam Oleat sebagai Zat Aditif Melalui Teknik Membran Cair Fasa Ruah*, Skripsi, Jurusan Kimia Universitas Andalas. Padang, 2006, 16-22.
 14. L. Longquan, W. Cheng, L. Yadong, Separation of Cobalt and Nickel by Emulsion Liquid Membrane With the Use of EDTA as Masking Reagent, *J. Membr. Sci.*, 135: 173 – 177, (1997).
 15. Refinel, Z. Kahar, Rahmayeni, Mofliarti, Optimasi Kestabilan Emulsi Sebagai Membran Cair Untuk Ekstraksi Fenol Dalam Air, *J. Kimia Andalas*, 5(2): 24-27, (1999).
 16. Refinel, Z. Kahar, Pengaruh Ion Klorida Dan Nitrat Terhadap Pemisahan Senyawa Fenol Dalam Air Dengan Teknik Emulsi Membran Cair, *J. Kimia Andalas*. 6(2), 77-80, (2000).
 17. Dingseng Hc*, Ming Ma. Zhenhua Zhao, Transport of Cadmium Ions Through a Liquid Membranes Containing Amine Extractants as Carriers, *J. Membr. Sci.*, 169: 53 – 59, (2000).
 18. H. Parham, and M. Shamsipur, Selective Membrane Transport of Pb^{2+} ion by a Cooperative Carrier Composed of 18-Crown-6, Tetrabutylammonium Iodide and Palmitic Acid, *J. Membr. Sci.*, 95: 21 – 27, (1994).
 19. Dean, *Langer's Handbook of Chemistry Ed. 13th*, New York, 1985, 88-89.