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Microreactor Extraction System with Macrocyclic Host Compounds for Rare Metal Recovery

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Extraction reagents based on *p*-t-octylcalix[4]arene with ketonic and 2-pyridyl groups were prepared to investigate extraction behavior of precious metal ions by using microreactor system. Although the ketonic derivative exhibited high silver selectivity in nitric acid media, it took for more than 72 h to reach extraction equilibrium. On the contrary, the extraction rate was drastically improved by using microreactor system. It took for 16 s to extract silver ion by using parallel two phases flow type microreactor. The silver extraction rate was further improved by using slug flow type microreactor to be within 4 s. The extraction rate for ketonic derivative was much more improved compared with that for 2-pyridyl one. One of the reasons why silver extraction rate was drastically improved by using microreactor system was attributed to the enhanced interfacial area. It was supported by the result for the interfacial tension measurement of two extraction reagents.

Key Words : Calixarene, Microreactor system, Solvent extraction, Precious metals, Resource recovery