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ZAŁĄCZNIK 4a

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Thesis title:

The application of extraction methods in the technology of recovering and separating the platinum group metals

Abstract:

This doctoral dissertation explored the possibility of selective separation of palladium, platinum, and rhodium using solvent extraction. The research material used was a multi-component technological solution derived from the leaching of waste materials, characterized by a relatively low content of platinum group metals (< 2.5 g/dm³ of each PGMs) and a high content of other basic metals, including copper. As part of the research work undertaken, a review of the current state of knowledge was carried out on effective and easily available extractants of platinum group metals, their re-extractants, as well as the application of extraction for the separation of platinum group metals in industrial conditions. The experimental part of this doctoral dissertation was divided into three main stages: studies of extraction; stripping; and precipitation and reduction of Pt, Pd, and Rh from the obtained re-extracts and raffinates after selective extraction of Pd and Pt. In each of these research sections, systematic studies were conducted on the impact of selected parameters on the efficiency of individual processes. These activities allowed to determine the most favorable process conditions for the developed separation technology, which was the primary goal of this project. The research resulted in the proposal of two schemes for the selective separation of Pt, Pd, and Rh from technological solutions. The developed methods are also covered by patent applications P.451899 and P.451913, and published in 4 articles.

Keywords:

platinum group metals; solvent extraction; separation of platinum group metals; precious metals

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