

Selective recovery of Pt(IV) and Rh(III) through the sequential process of biosorption, desorption, and incineration

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The platinum group metals (PGM) are mainly used for catalyst of automobile and petrochemicals, glass industry, dental materials, electric and electronic components, etc. Above all, the demand for the automobile catalyst reaches about 60%. In Korea, all PGM are being imported. Therefore PGM should be recycled from secondary resources in the aspects of national economy or resources security. For this, an economic eco-conscious-recycling technique is needed. The purpose of this study is to separate Pt and Rh from spent automobile catalyst waste solution. The solution concentration of Pt and Rh was made in the ratio of 6:1 according to composition of the spent automobile catalyst. And polyethylenimine (PEI)-modified *Corynebacterium glutamicum* was developed as a high performance biosorbent for anionic metals. As a result, the developed sorbent showed selective binding property toward Pt in the binary metal system. Pt was successfully recovered by desorption from metal-loaded biosorbents, while Rh was not desorbed. Rh-loaded biosorbents was incinerated, resulting in Rh-rich ash. Consequently, Pt and Rh were successfully separated via selective sorption, desorption and incineration process.