International J. of Engg. Research & Indu. Appls. (IJERIA).
ISSN 0974-1518, Vol.3, No. IV (November 2010), pp. 379-397

REDUCTION OF PLATINUM IN REFINING EFFLUENT TROUGH PRECIPITATION USING AMMONIUM CHLORIDE

E. MUZENDA, M. BELAID, T. PHETLA AND M. MOLLAGEE

Abstract

This study investigated possible ways to improve the efficiency of the platinum precipitation process using ammonium chloride by reducing the platinum content reporting to the effluent. The ore treated consist of five platinum group metals namely, ruthenium, rhodium, iridium, platinum, palladium and a precious metal gold. Gold, ruthenium, rhodium and iridium were extracted prior the platinum precipitation process. Temperature, reducing agent, flow rate and potential difference were the variables controlled to determine the operation conditions for optimum platinum precipitation efficiency. Hydrogen peroxide was added as the oxidizing agent at the temperature of 85-90°C and potential difference of 700-850mV was the variable used to check the oxidizing state of platinum. The platinum was further purified at temperature between 60-65°C, potential difference above 700 mV, ammonium chloride of 200 *l*, and at these conditions the platinum content reporting to the effluent was reduced to less than 300ppm, resulting in optimum platinum precipitation efficiency and purity of 99.9%.

Keywords : Platinum group metals (PGM), potential difference, precipitation, redox reactions