

ABSTRACT

Gold is a precious metal that is sought after for its high economic value. Gold refining is generally done through pyrometallurgical and hydrometallurgical methods, such as cyanidation and amalgamation, but these methods produce hazardous waste such as cyanide and mercury that pollute the environment and harm human health and ecosystems. This research develops and optimizes the gold refining process with a microcontroller-controlled electrowinning method to regulate voltage, current, electrolyte flow, refining time, and solution pH. The principle of electrolysis is used to reduce gold ions into gold deposits on the cathode. This automatic regulation improves efficiency, consistency, and reduces energy consumption and waste, making electrowinning an effective and environmentally friendly method for gold refining on a small and large industrial scale.

Keywords: Gold Refining, Electrowinning, Microcontroller, Eco-friendly