Development of an on-line E_h – pH electrochemical sensor for copper flotation plants

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An electrochemical sensor for on-line measurements of pH and E_h in copper sulfide flotation plants, has been developed. The electrochemical system includes an ORP – Pt ring electrode, a metallic Sb electrode, a high impedance Ag/AgCl reference electrode and a potentiostat. For pH and E_h measurements, the electrode potentials are measured against a reference electrode , and they may be cleaned in-situ, by using the potentiostat.

Twelve sensors are successfully being installed in the conventional grinding-rougher copper flotation circuit lines in the El Teniente copper mine, since January 2002, allowing an on-line control of pH and E_h. The Pt and Sb metallic electrodes have proved to be very useful for monitoring redox potential and pH in flotation plants, where their robustness is a particular advantage.