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"Gheorghe Asachi" Technical University of Iasi, Romania

RESEARCHES ON POSSIBILITY TO RECOVER AND REUSE THE IRON(II) SULPHATE FROM ETCHING OF ROLLED STEELS

Liliana Lazăr*, Ion Balasanian, Florin Bandrabur

"Gheorghe Asachi" Technical University Iasi, Faculty of Chemical Engineering and Environmental Protection, Department of Chemical Engineering, 71 D. Mangeron, Iasi, 700050

Abstract

The etching of iron materials in sulphuric acid solutions allows the dissolution of the iron oxides with formation of iron sulphates. The relatively low solubility of the formed sulphates imposes their separation for avoiding the contamination of the etching bath, as well as for preventing the environmental pollution through the wastewater. Within the flow sheet of the processing of the hot or cold rolled steel, a stage of separation by crystallization of iron sulphate is foreseen. The resulted iron(II) sulphate does not meet the qualities of the technical product ($FeSO_4 \cdot 7H_2O$), fact that limits its utilization.
In this paper, the possibility of recovering the iron(II) sulphate resulted from preliminary processing of the solution from etching of rolled steels is studied. The re-crystallization of iron(II) sulphate from saturated solutions was investigated in order to reduce the free acidity and the content of iron(III) sulphate, as well as to enhance the granulometry spectra. The re-crystallization was performed in two stages at the temperature of 283.15 K. The obtained product meets the quality requirements for technical iron(II) sulphate approved by the STAS 2189-80.

Key words: crystallization, environmental protection, iron(II) sulphate, recovery, wastewater

* Author to whom all correspondence should be addressed: e-mail: lillazar@ch.tuiasi.ro