

Recovery of Mn as MnO₂ from spent batteries leaching solutions

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Abstract. The recycling of spent batteries and recovery of metals from them is of great scientific and economic interest, on account of recycling requirement of these wastes and recovery of valuable materials (De Michellis et al., 2007). Usage of recycled materials is diminishing the energy consumption and pollution. It is important that the recycling process to be environmentally friendly, practical and cost-effective. Tests for the process of manganese removal from spent battery leaching solutions, with ammonium peroxodisulfate, prior to recovery of zinc by electrolysis are presented. The experiments were carried out according to a 2³ full factorial design as a function of ammonium peroxodisulfate concentration, temperature and pH. Because the excessive manganese in the spent batteries leach solutions can cause problems in the process of Zn recovery by electrolysis the main focus of this study is the manganese removal without altering the concentration of zinc in solutions. Data from XRF and AAS during the reaction at different time are presented. Manganese is obtained with high extraction degree as MnO₂, which is economic and commercial important with applications in battery industry, water treatment plants, steel industry and chemicals (Pagnanelli et al., 2007). The analysis of variance (ANOVA) was carried out on the extraction yields of Zn after 30min, 1h, 2h and 3h of reaction. The preliminary results denoted that by chemical oxidation with ammonium peroxodisulfate is a suitable method for manganese removal as MnO₂ prior zinc recovery by electrolysis, from spent batteries solutions and it could be used in a plant for recycling batteries.

Key words: manganese, zinc, spent battery leaching solution

References

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