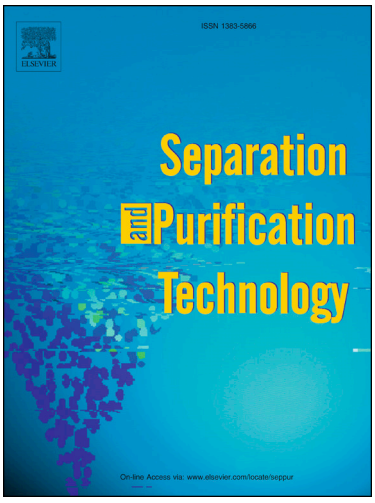

Stripping of iron(III) from iron(III)-loaded Aliquat 336 generated during aluminum recovery from coal waste leach liquor using sodium sulfite

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PII: S1383-5866(17)33528-1
DOI: https://doi.org/10.1016/j.seppur.2018.01.048
Reference: SEPPUR 14342

To appear in: *Separation and Purification Technology*

Received Date: 30 October 2017
Revised Date: 14 January 2018
Accepted Date: 21 January 2018

Please cite this article as: L. Cui, Z. Zhao, Y. Guo, F. Cheng, Stripping of iron(III) from iron(III)-loaded Aliquat 336 generated during aluminum recovery from coal waste leach liquor using sodium sulfite, *Separation and Purification Technology* (2018), doi: https://doi.org/10.1016/j.seppur.2018.01.048

Stripping of iron(III) from iron(III)-loaded Aliquat 336 generated during aluminum recovery from coal waste leach liquor using sodium sulfite

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Abstract:

Stripping is a necessary step for the recovery and reuse of extracting agent in hydro metallurgical process. This study reported an effective way employing sodium sulfite for the stripping of iron(III) from Aliquat 336 with a high iron loading, which was generated in the iron removal from coal waste hydrochloric acid leach liquor. The stripping behavior has been studied using iron(III)-loaded Aliquat 336 obtained after the extraction of iron(III) from synthetic ferric chloride solution. The results showed that approximate 95% of iron(III) can be stripped from Aliquat 336 loaded with up to 70 g/L of iron(III) after only one time of contact under the optimum conditions, where 0.8 mol/L of sodium sulfite was used to strip(III) iron from Aliquat 336 for 30 min at 50 ^{o}C with a 1:2 volume phase ratio (O/A, volume of iron(III)-loaded Aliquat 336 to 0.8 mol/L sodium sulfite aqueous solution). The stripping mechanism of iron(III) with sodium sulfite can be explained as the combination reactions of hydrolysis and reduction. Increasing the stripping temperature favored the stripping of iron(III). The stripping method was further tested to remove iron from Aliquat 336 after being used for the extraction of iron(III) from coal gangue hydrochloric leach liquor. The results showed more than 95% of iron(III) can be extracted after Aliquat 336 being recycled for nine times using 0.8 mol/L sodium sulfite as stripping solution, which is far more effective than sulfuric acid or deionized water employed in the previous reports, further simplifying the stripping operation and reducing the extractant loss.

Keywords: Stripping of iron(III), iron(III)-loaded Aliquat 336, sodium sulfite, coal wast leach liquor

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