Copper extraction by fatty hydroxamic acids derivatives synthesized based on palm kernel oil

ABSTRACT

Fatty hydroxamic acids derivatives based on palm kernel oil which are phenyl fatty hydroxamic acids (PFHAs), methyl fatty hydroxamic acids (MFHAs), isopropyl fatty hydroxamic acids (IPFHAs) and benzyl fatty hydroxamic acids (BFHAs) were applied as chelating agent for copper liquid-liquid extraction. The extraction of copper from aqueous solution by MFHAs, PFHAs, BFHAs or IPFHAs were carried out in hexane as an organic phase through the formation of copper methyl fatty hydroxamate (Cu-MFHs), copper phenyl fatty hydroxamate (Cu-PFHs), copper benzyl fatty hydroxamate (Cu-BFHs) and copper isopropyl fatty hydroxamate (Cu-IPFHs). The results showed that the fatty hydroxamic acid derivatives could extract copper at pH 6.2 effectively with high percentage of extraction (the percentages of copper extraction by MFHAs, PFHAs, IPFHs and BFHAs were found to be 99.3, 87.5, 82.3 and 90.2%, respectively). The extracted copper could be quantitatively stripped back into sulphuric acid (3M) aqueous solution. The obtained results showed that the copper recovery percentages from Cu-MFHs, Cu-PFHs, Cu-BFHs and Cu-IPFHs are 99.1, 99.4, 99.6 and 99.9 respectively. The copper extraction was not affected by the presence of a large amount of Mg (II), Ni (II), Al (III), Mn (II) and Co (II) ions in the aqueous solution.

Keyword: Copper benzyl fatty hydroxamates; Copper extraction; Copper isopropyl fatty hydroxamates; Copper methyl fatty hydroxamates; Copper phenyl fatty hydroxamates; Fatty hydroxamic acid derivatives; Palm kernel oil; Solvent extraction