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Solvent extraction of calcium ion from cation-exchange resin regeneration wastewater using D2EHPA and saponified D2EHPA

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ABSTRACT

Solvent extraction experiments of Ca^{2+} with D2EHPA and 15% saponified D2EHPA from cation-exchange resin regeneration wastewater have been performed. Compared with the extraction efficiency (E) of Ca^{2+} with D2EHPA, the use of 15% saponified D2EHPA significantly increases the extraction efficiency (E) of Ca^{2+}. In this work, a systematic study on the extraction of Ca^{2+} from cation-exchange resin regeneration wastewater using saponified D2EHPA has been carried out. To study the extraction efficiency and advantages of the method in the removal of Ca^{2+}, various parameters such as saponification ratio of D2EHPA, D2EHPA mass fraction, reaction temperature, phase mass ratio, initial pH of wastewater, transfer-speed, and transfer-time are studied and optimized. The results show that Ca^{2+} in wastewater can be effectively removed by saponified D2EHPA. An extraction efficiency of more than 99.9% is attained at the optimized parameters and the cation-exchange resin regeneration waste-water can be discharged directly by two levels of extraction, and it meets the Chinese National Emission Standards.

Keywords: D2EHPA; Saponified D2EHPA; Ca^{2+} from regeneration wastewater; Extraction

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