Electrodialytic remediation of suspended mine tailings - DTU Orbit (22/12/2018)

Electrodialytic remediation of suspended mine tailings
This work shows the laboratory results of nine electrodialytic remediation experiments on copper mine tailings. A newly designed remediation cell, where the solids were kept in suspension by airflow, was tested. The results show that electric current could remove copper from suspended tailings applying 40 mA during 7 days. The liquid-to-solid ratios used were 3, 6 and 9 mL g⁻¹. With addition of sulfuric acid, the process was enhanced because the pH decreased to either 2 or 4, and copper was therefore dissolved. The maximum copper removal was 80% with addition of sulfuric acid in 7-day experiment at 40 mA, with approximately 137.5 g mine tailings on dry basis. The removal for a static (baseline) experiment only amounted 15% when passing approximately the same amount of charge through 130 g of mine tailings. The use of air bubbling to keep the tailings suspended increased the removal efficiency from 1% to 80% compared to experiments with no stirring but with the same operational conditions. This showed the crucial importance of having the solids in suspension and not settled during the remediation.

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