

Recovery of Boron from Industrial Wastewater by Chemical Oxo-Precipitation

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Abstract : This work investigated the reclamation of boron in industrial wastewaters by a chemical oxo-precipitation (COP) technique at room temperature. In COP, the boric acid was pretreated with H_2O_2 , yielding various perborate anions. Afterwards, calcium chloride was used to efficiently remove boron through precipitation of calcium perborate. The important factors included reacted pH and the molar ratio of [Ca]/[B]. Under conditions of pH 11 and [Ca]/[B] of 1, the boron concentration could be reduced immediately from 600 ppm to 50 ppm in 10 minutes. The boron removal was enhanced with a higher [Ca]/[B], which further reduced boron to 20 ppm in 10 minutes. Nevertheless, the dissolution of carbon dioxide potentially affected the efficacy of COP and increased the boron concentration after 10 minutes.

Keywords : chemical oxo-precipitation, boron, carbon dioxide, hydrogen peroxide

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