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Review of the hydrometallurgical processing of non-sulfide zinc ores

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Abstract: Non-sulfide zinc deposits were the prime source for zinc metal production for hundreds of years. However, during the early 20th century, their significance diminished due to the development of flotation and smelting techniques for zinc sulfides. At the present time, zinc sulfide ores are the most significant source of zinc, accounting for approximately 85% of zinc production. This has resulted from the fact that the conventional flotation method generally is effective in enriching zinc minerals from sulfide deposits into a high -grade concentrate that can be treated at conventional smelters worldwide for the recovery of zinc metal. However, in recent years, the shortage of zinc sulfide concentrates in the world market, coupled with increased demand from developed and emerging countries, has renewed commercial interest in non-sulfide zinc deposits. This interest has been further intensified by the discovery of new hydrometallurgical acid-leaching, solvent extraction (SX), and electrowinning (EW) technologies, as well as the modernization of the Waelz technology , for the treatment of non-sulfide zinc ores. Given these considerations, this article provides a summary of the published information associated with the extraction of zinc from non-sulfide zinc ores.