

# Recovery of Copper, Cobalt, and Zinc From Copper Smelter and Converter Slags

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## ABSTRACT

A study on the recovery of copper, cobalt, and zinc from copper smelter and converter slags by roasting with sulfuric acid has been conducted. Acid roasting of slags followed by hot water leaching was carried out to bring the metal values into solution. In the leaching experiments, the effects of roasting time, acid/slag ratio, roasting temperature, and application of thermal decomposition prior to leaching on the metals dissolution extents were investigated. 88% of copper, 87% of cobalt, 93% of zinc, and 83% of iron were extracted in 2 h of roasting at 150°C and 3/1 acid/slag ratio. Increasing acid roasting temperature and time did not have increasing effect on the Co and Zn dissolution extents while significant improvements were observed in Cu dissolution. Application of thermal decomposition prior to leaching gave small decreases in metal extractions, but since there was no iron dissolution, it was favoured from the viewpoint of metal recoveries from the leachates due to the elimination of an iron removal step.