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Processing of indium: a review

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Abstract

Indium is an important by-product of zinc metal processing operations. Indium and other metal values are recovered during the production of primary commodities such as zinc by means of complex procedures, many of which are proprietary to each producer. One zinc recovery method consists of the Waelz process followed by leaching and purification prior to electrolytic recovery of zinc as cathodes and subsequent containment of the indium fraction in residues. Related processes for recovery of lead and tin from smelters and refineries also provide indium and other compounds. Indium may be associated with other valuable elements such as vanadium, thallium, gallium and germanium, and cadmium. Typical sulphide-bearing host minerals consist of Sphalerite, Galena, and Chalcopyrite. The igneous intrusions in sedimentary formations may include other base metals such as copper, cobalt, and noble metals consisting of gold, silver, and platinum group metals. The review serves to assimilate the major highlights of this somewhat rare metal which has both strategic importance and is well suited to electronic applications. On a global basis, the writers are aware of 30 producers dedicated to the commercial production of indium metal. Countries such as Belgium, Canada, China,

France, Japan, Russia, and the USA are the largest producers of indium while about ten other countries contribute smaller quantities for worldwide consumption. The supply and demand of pure indium products during the past 40 years has been erratic and subject to wide fluctuations in delivered price. The paper describes the sources and established industrial processes for recovery of indium originating from sulphidic materials and process reverts.



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Keywords

Electrometallurgy; Extractive metallurgy; Non-ferrous metallic ores; Hydrometallurgy

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