TUNSTEN EXTRACTION FROM TUNGSTEN CARBIDE SCRAP

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Abstract

Tungsten and its alloys find major application in important sector like mining, aerospace, defence etc. Tungsten has got several incredible properties like high hardness, high density and high melting point. Tungsten carbide (WC) is one of the hardest materials and hence is used to make a variety of hard cutting materials for eg. Cemented tungsten carbides. Currently cemented tungsten carbides are used on a large scale in industries for the production of cutting tools for machining processes, wear resistant parts, and similar industrial uses. With increase in globalization the need for manufactured goods will also increase, and the consumption of tungsten carbide will grow. However, tungsten is a finite natural resource, and effective recycling is the only solution to the problem of tungsten depletion. In order to meet such a challenge, it is of vital importance that the recycling process should be efficient, environmentally friendly, and economically viable. Moreover the quality of the recycled product must be comparable to those manufactured from virgin materials. So, this paper present comparative study on Tungsten extraction as high pure Tungsten from tungsten carbide hard metal scrap. Various methods are available from recycling of tungsten carbide. Here this research emphasizes on comparative study between three processes 1. Alkaline leaching by different routes has been carried out and optimized, 2. Zinc melting method WC-Co as a powder from cutting tools scrap, 3. Recycling of tungsten by hydrometallurgical route.

Keywords— *Alkaline leaching, Zinc melting, hydrometallurgical route, Sodium Hydroxide*

Professional Biography

Mr. Harsh Sojitra has completed his B.Tech. in Metallurgical Engineering from Indus University, Gujarat in the current year 2018. He has participated in various events like Student Start-up and Innovation Policy by Government of Gujarat, 55th National Metallurgists' Day (NMD) & 71st Annual Technical Meeting (ATM) at BITS, Pilani; won 2nd prize for paper presentation in BTTD 2017 at CSIR-NML, Jamshedpur; won 2nd prize for paper presentation at IIT, Gandhinagar.



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