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Complex processing of manganese bearing waste and low-grade ores by autoclaving method

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Environmental Health Sciences

Research output: Contribution to journal › Article › peer-review

1
Scopus citations

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Abstract

Experimental research was carried out using representative samples of copper processing waste and the manganese processing waste disposed in Georgia to achieve secondary recovery of valuable metals from the waste. Joint autoclave oxygen leaching of different compositions of low-grade ores and waste using microwave treated samples was studied to assess recovery of metals from waste and low-grade ores. The data showed that complex utilisation of manganese and pyrite bearing waste can form the basis for a low-cost and environmentally-friendly industrial production of manganese oxide concentrates and low-carbon alloys, sulphur and copper compounds, and concentrates for gold and silver extraction. The developed methods can partially replace the standard technologies of ferroalloys industry, which uses reducing manganese oxides by carbon. This would significantly decrease the carbon monoxide and carbon dioxide emissions during production of ferromanganese and metallic manganese while reducing the emission of greenhouse gases and mitigating global warming.

Original language	English (US)
Pages (from-to)	291-306
Number of pages	16

Journal	International Journal of Global Warming
Volume	10
Issue number	1-3
State	Published - 2016

Keywords

Autoclaving | Copper | Environment | Gold | Manganese | Ore | Waste

Publisher link

10.1504/IJGW.2016.077919

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- Manganese — Earth & Environmental Sciences
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- Copper compound — Earth & Environmental Sciences
- Method — Earth & Environmental Sciences
- Industrial production — Earth & Environmental Sciences
- Metal — Earth & Environmental Sciences
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APA Standard Harvard Vancouver Author BIBTEX RIS

Chirakadze, A., Gurchumelia, L., Khomeriki, I., Toscano, W. A., Bazghadze, I., Geleishvili, I., Gvakharia, V., & Geleishvili, T. (2016). Complex processing of manganese bearing waste and low-grade ores by autoclaving method. *International Journal of Global Warming*, *10*(1-3), 291-306. https://doi.org/10.1504/IJGW.2016.077919

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