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**Pyrolysis of arsenic-bearing gypsum sludge being substituted for calcium flux in smelting process**

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Highlights

- The pyrolysis of arsenic-bearing sludge is studied by TG-FTIR.
- Arsenic migration and decomposition pathway of gypsum are probed.
- Co-disposal method in ISASMELT copper smelting process is proposed for ABG sludge.

**Abstract:** Arsenic-bearing gypsum (ABG) sludge, one of the biggest hazardous waste in the nonferrous metals industry, greatly threatens the ecological safety due to possible leakage and diffusion risks. However, the state-of-the-art techniques suffer great challenges for the disposal of ABG sludge due to its properties including worthless constituents, high arsenic leaching toxicity, and tremendous output. In this work, the pyrolysis of ABG sludge is studied aiming to propose a flexible and facile co-disposal method by using ABG sludge as calcium flux instead of limestone in smelting processes. The pyrolysis behaviour and arsenic migration are investigated in the

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