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Effect of elevated temperature on absorbing CO₂ by red mud**Rami A Bamagain, Bandar A Fadhel, Ahmad D Hammad, Wajdi E Sadat and Turki M Almutairi**
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Red Mud (RM) is the major waste material produced during alumina production via Bayers process. Depending on the quality of the raw material processed, 1 to 2 tons of RM is generated per ton of alumina produced. RM is classified as hazardous waste and one of the current disposal practices is to pump it into ponds as slurry. Several approaches have been investigated to mitigate the risk associated with RM and/or identify potential utilization means. One of the promising techniques is to treat RM with carbon dioxide, which is a greenhouse gas. Therefore, many laboratory studies were conducted to investigate the ability of RM to sequester carbon dioxide at ambient conditions. In this paper, the effect of elevated temperature on the ability of Saudi Arabian red mud to absorb CO₂ was examined, to mimic the arid and hot climate in Saudi Arabia, the only global alumina producer having such weather. Saudi Arabian RM was first characterized by XRD, XRF and ICP-MS, after which, it was subjected to carbon dioxide at different temperatures. The result revealed that the maximum CO₂ uptake was at 35°C, which is fortunately the annual average temperature in Saudi Arabia. The results of this study avail the opportunity to mitigate the hazardous RM of Saudi Arabia, while simultaneously reduce the country's carbon dioxide emissions.

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