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Environmentally Benign Recovery of Critical Minerals from Domestic Resources

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The demand for critical minerals (CMs) essential to emerging technologies is projected to increase by over 450% by 2050. Currently, the United States relies heavily on imports to meet this demand. Conventional CM extraction processes are labor-intensive and environmentally detrimental, generating significant waste streams. Ensuring a secure, reliable, and sustainable domestic supply of CMs is vital for national security and achieving net-zero carbon goals by 2050. Success in this endeavor hinges on the development of environmentally friendly extraction methods targeting unconventional and secondary domestic sources.

This presentation will highlight ongoing efforts to recover critical minerals using environmentally benign techniques from secondary and unconventional resources, including coal ash, shale, mine tailings, and lithium clay deposits. Key findings and progress in the recovery of these feedstocks will be shared, emphasizing the potential for sustainable domestic CM production.

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