



Project Selections for FOA 2619: BIL - Advanced Processing of Rare Earth Elements and Critical Minerals for Industrial and Manufacturing Applications (Round 2)

**Project Selections for FOA 2619: BIL - Advanced
Processing of Rare Earth Elements and Critical
Minerals for Industrial and Manufacturing
Applications (Round 2)**

TOPIC AREA 1 — Advanced Process Development for Production of Rare Earth Metals and Co-Production of Critical Minerals and Materials from Coal-Based Resources

Molecular Design of Microemulsion Extraction System to Improve the Production of Rare Earth Metals and Co-Production of Critical Minerals and Materials from Coal-Based Resources — **California Institute of Technology** (Pasadena, California) plans to integrate both traditional and innovative rare earth separation methods (conventional liquid-to-liquid extraction and advanced microemulsion liquid-to-liquid extraction) to obtain individual rare earth elements in a highly pure form while simultaneously generating critical minerals and materials. The project also plans to harness low-temperature plasma technology for producing rare earth metals. This approach potentially provides improved selectivity, augmented energy efficiency, and enhanced control over the reduction reactions.

DOE Funding: \$ 4,890,160

Non-DOE Funding: \$ 1,293,287

Total Value: \$ 6,183,447

Advanced Processing for Critical Materials Extraction, Recovery, Separation, and Purification — **University of Utah** (Salt Lake City, Utah) plans to produce individually separated high-purity rare earth oxides, rare earth salts, rare earth metals, and critical minerals and materials from abundant, low-grade coal by-products using innovative mineral and chemical separation technologies at 20% less cost than conventional methods. The project will include evaluating technologies for physical upgrading of sample feedstock materials; extracting rare earth elements and critical minerals and materials using environmentally friendly methods; separating rare earth elements and critical minerals and materials into individual high-purity rare earth salts, oxides, and critical minerals and materials products; producing high-purity rare earth metals and critical minerals and materials using innovative reduction technologies; evaluating the overall integrated process for energy and mass balances with a related technoeconomic analysis; and producing associated energy equity and workforce impact plans to gauge potential community benefits.

DOE Funding: \$ 4,999,999

Non-DOE Funding: \$ 1,250,000

Total Value: \$ 6,249,999



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