



THE AMES LABORATORY'S ADVANCED SYNTHESIS CAPABILITIES

The Ames Laboratory Creating Materials and Energy Solutions

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Need a Material? The Ames Laboratory has the nation's most comprehensive facilities for advanced materials synthesis. We enable science through our synthesis capabilities and new innovations in the science of synthesis.

Alloy synthesis: Alloys never before made or difficult to prepare are our specialty. From casting to inert solid-state synthesis to thin-film deposition, we can do it all. Our capabilities include synthesis under inert conditions, mechano-chemical milling and spark erosion synthesis.

Structured material and chemical synthesis: We have developed novel DNA-templated nanoparticle, structured mesoporous catalytic, inorganic chemical, and thin-film composite synthesis methods. Materials for near net shape engineering applications are a specialty.

Powder production: Our research in powder synthesis has led to new methods for gas atomization of powders with controlled size distributions and composition, crucial for major advances in additive manufacturing.

Single crystal growth: Uncommon capabilities include single-crystal growth from light, volatile and reactive materials, in addition to our capabilities and expertise in growing large crystals of numerous alloys to meet specific research needs.

Metal purification: For research materials, purity matters. Alkali, alkaline-earth and rare-earth element purification are specialties. For rare earths, we reach 99.996% rare-earth purity — the purest in the world.



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U.S. DEPARTMENT OF ENERGY