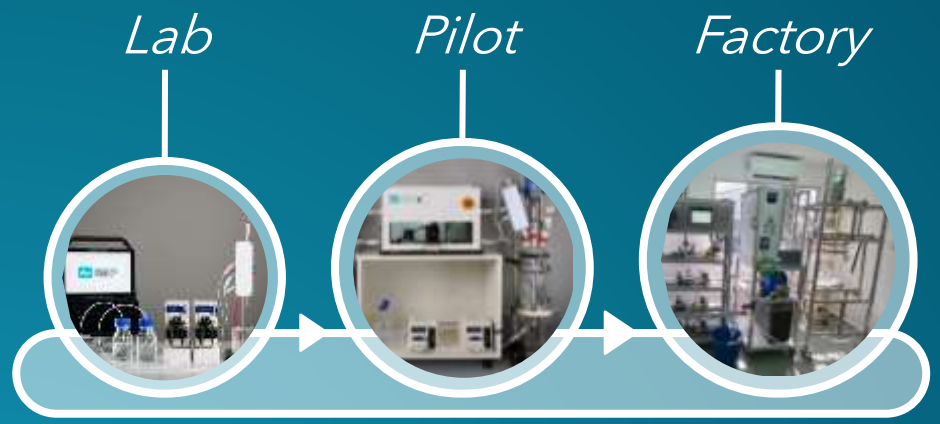




ACCELERATED MATERIALS

Accelerating Emerging Materials with AI
Ceramics Expo 2026 | Cleveland, OH

K-SERIES



Autonomous Manufacturing for Critical Nanomaterials

About Accelerated Materials

The Problem We Solve

- The decade-long gap between lab discovery and industrial production for critical materials

Industries we work with

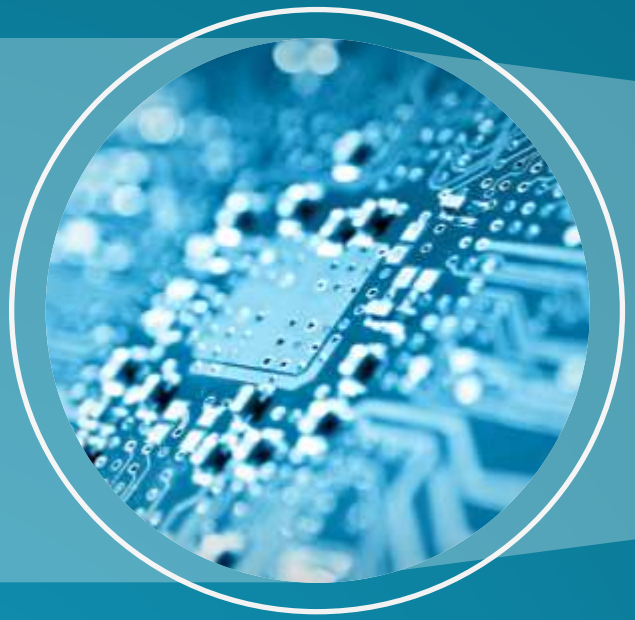
- Semiconductors, Energy & Healthcare

Our Business

- Lab-to-factory, full-stack solutions across hardware, software, R&D and licensing

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Critical Bottlenecks for Next Generation Ceramics



A Manufacturing **SuperCycle**

- **Drivers:** AI, Digitization and Electrification
- **Restraint:** Nanomaterial manufacturing capacity



The Lab to Factory **Gap**

- **Critical issue**: 10-20 years from lab to market
- **Technology limit**: Conventional R&D tools are **difficult to scale**

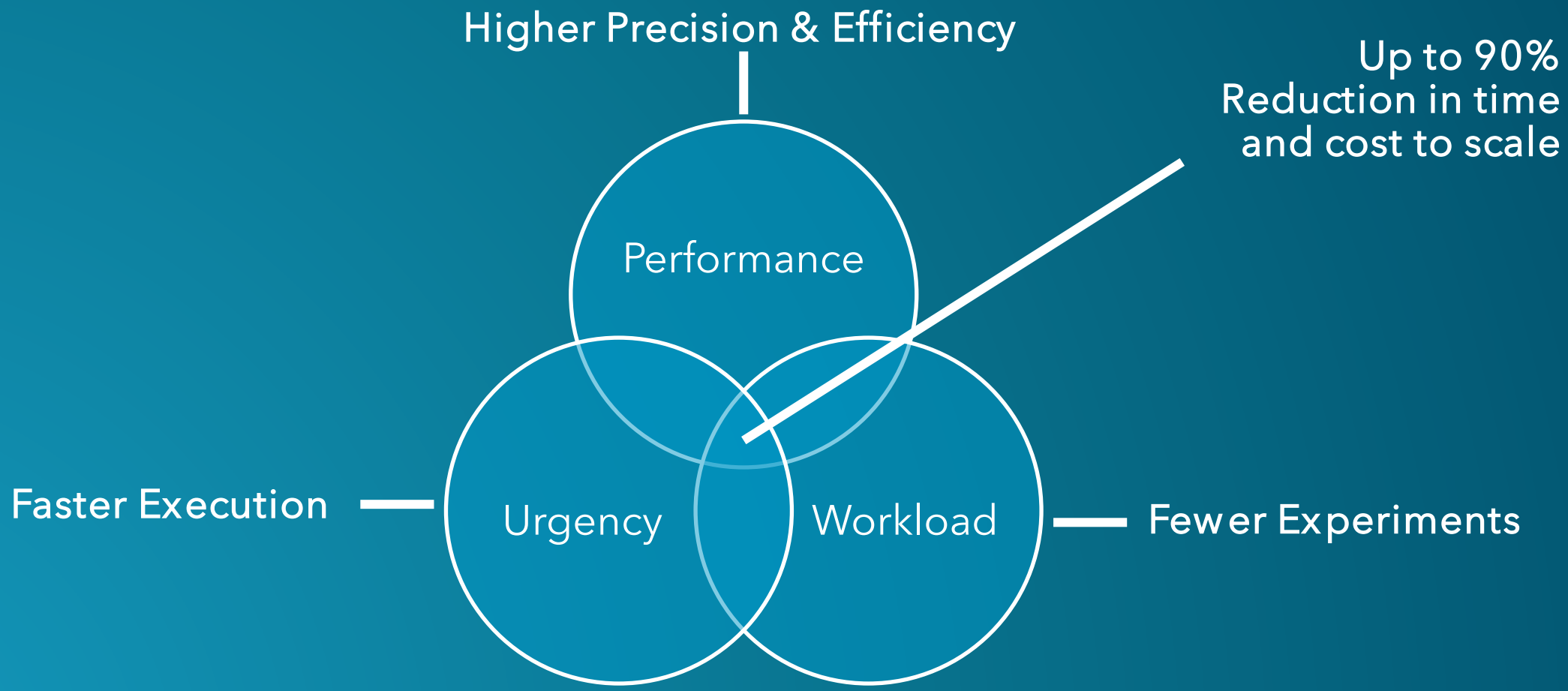


The Supply Chain **Crisis**

- **Triggers**: Geopolitical conflicts, tariffs and climate
- **#1 Victim:** Critical materials
- **Solution**: Local production

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How New AI Tools Solve The Scale-Up Challenge



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Implementing AI: from concept to system

Methods	Neural Networks	Bayesian Optimization	Autoencoders & Diffusion Models	Large Language Models
Tools	Property-Structure Maps	Optimizers	Generative Design	Agents
Uses	Property Prediction	Design of Experiments	Materials Design	Knowledge Extraction & Planning
Systems	High Throughput Sceening	Closed Loop Optimization	Digital Twins	Self Driving Labs & Factories

From AI-assisted process optimization to commercial production

A Case Study of Nano Zinc Oxide

Specifications:

- 20 nm
- >99% Wurtzite
- Spherical

Microreactor Co-precipitation

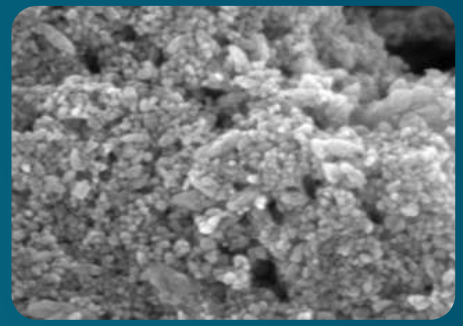


Bayesian Optimization (TSEMO)

Production Recipe



Digital Twin



Commercial Production

Jose *et al. Chem Eng J* 426, 131345 (2020)
Jose *et al. AICHE Annual Meeting* (2025)
Jose & Lapkin, *Nature Chemical Engineering* 2, 615–617 (2025)
Zhang *et al. Chem Eng J* 533, 174361 (2026)

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Insights

Opportunity

- New AI tools can dramatically accelerate product and process development of emerging nanoceramics

Challenge

- Pilots without focus = an inadequate “toolset”

Approach

- Use the right tools for the job – even with AI

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