

Technology Offer

CSIC/NG/003

Sulfide Solid Electrolyte Precursor Chemical for Solid-State Batteries



Stable liquid thiophosphate chemical for the production of sulfide solid State electrolytes.

Intellectual Property

Priority patent application filed

Stage of development

Laboratory tested and validated

Intended Collaboration

Licensing and/or co-development

Contact

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Market need

Sulfide solid electrolyte manufacturing remains limited by slow, energy-intensive, and poorly reproducible synthesis methods, driving up production costs. Existing solid-state and solution routes require long processing times, high energy input, and strict atmosphere control, leading to batch variability and expensive infrastructure. A true liquid-phase process resolves the complexity of mixed-phase synthesis by eliminating particle-size and morphological constraints on the reaction. This approach significantly reduces processing time, energy consumption, and equipment requirements. As a result, it lowers manufacturing costs and supports the large-scale, cost-effective production of solid-state batteries.



Proposed solution

We propose a stable, shelf-ready liquid-phase thiophosphate precursor that enables instant, room-temperature synthesis of sulfide solid electrolytes on demand. The precursor maintains chemical stability during storage but converts rapidly and quantitatively upon activation, ensuring precise stoichiometry and uniform mixing.

This approach eliminates high-temperature processing and long milling steps. Also, it reduces energy consumption, processing time, and batch variability. The result is a scalable, reproducible feedstock suitable for continuous and industrial solid-state battery manufacturing.

Competitive advantages

- **Instant synthesis:** room-temperature conversion in seconds not hours or days.
- **Shelf-stable precursor:** safe storage and transport without loss of reactivity.
- **High reproducibility:** precise stoichiometry and low batch-to-batch variability.
- **Lower cost & energy use:** eliminates high-temperature and long milling steps.
- **Industrial scalability:** compatible with continuous and roll-to-roll processing.