

CPS-LiPC

Ionic Interfacial Functional Material for LFP/LMFP Carbon Precursors

Technical Data Sheet (TDS) | CPS Inc.

Product Overview

CPS-LiPC is an ultra-low-viscosity ionic interfacial functional material based on aqueous Li-PAN and citric acid (CA). It is designed for evaluation in LFP/LMFP carbon precursor manufacturing processes to promote uniform mixing with carbon sources and conductive additives and to functionalize particle surfaces and interfaces.

1. Purpose of Carbon Precursor Application

- Uniform mixing and coating support:** Uses its ultra-low-viscosity aqueous characteristics to promote uniform contact between LFP/LMFP precursors or active materials and carbon sources/conductive additives.
- Carbon interfacial functionalization:** Utilizes the polar and ionic functional groups of CPS-LiPC to evaluate the potential for improved binding and stabilization at the active material-carbon interface.
- Li⁺ transport pathway support:** Forms a uniform distribution of ionic polymer at the precursor stage before carbonization or heat treatment to evaluate the potential for improved Li⁺ transport and high-rate performance in the final electrode.
- Compatibility with aqueous processing:** Enables water-based mixing without organic solvents and is designed with low viscosity for easy application to precursor manufacturing processes such as spray drying.

2. Typical Properties and Product Characteristics

Item	Typical Range / Property	Remarks
Appearance	Clear to pale-yellow aqueous solution	Low-odor solution
pH	7.0 ± 0.2	Neutral range
Solid Content	7.5 ± 0.5 wt%	Can be diluted to suit customer process
Viscosity	30 ± 10cP Brookfield, 2 rpm, 25°C	Values may vary depending on measurement conditions
Dispersion Medium	Water	Aqueous process
Key Features	Low viscosity · uniform mixing · carbon interfacial functionalization	LFP/LMFP precursor additive

3. Recommended Applications

LFP / LMFP carbon precursor and carbon-coating processes — Additive for spray drying, wet mixing, precursor surface treatment, and carbon-source/conductive-additive composite processes.

※ This product is a platform material that is not limited to a specific carbon source or heat-treatment condition. The optimum dosage and heat-treatment conditions should be verified in the customer’s process.

4. Recommended Evaluation Design

Category	Control	CPS-LiPC Group	Key Evaluation Items
Precursor Mixing	Existing LFP/LMFP carbon precursor recipe	Existing recipe + small amount of CPS-LiPC	Dispersion stability, viscosity, spray stability

Heat Treatment / Carbonization	Maintain existing conditions	Apply the same conditions first	Carbon distribution, particle morphology, residues
Electrode Evaluation	Existing control electrode	Use CPS-LiPC-treated precursor	ICE, capacity, 1C/3C/5C/7C, EIS, cycle

5. Expected Effects

- Potential for more uniform distribution of carbon sources/conductive additives on particle surfaces.
- Potential for improved binding and contact stability at the LFP/LMFP particle-carbon interface.
- Potential to simultaneously support the electronic conductive network and Li⁺ transport pathways.
- Potential for improved high-rate performance and repeated charge/discharge stability.
- Potential for improved spray-drying and wet-mixing processability due to the ultra-low-viscosity aqueous formulation.

6. Application Guide

- For initial evaluation, it is recommended to maintain the existing carbon precursor process as the control and vary only the Li-PAN/CA dosage stepwise.
- If necessary, dilute with DI water to meet the target viscosity and solids content for spray drying or wet mixing.
- After heat treatment, comparative evaluation of carbon structure and residual components by Raman, SEM/TEM, TGA, etc. is recommended.

7. Handling and Storage

Store tightly sealed at room temperature. Avoid freezing, high temperatures, and prolonged exposure to direct sunlight. After long-term storage, check appearance, pH, viscosity, and sedimentation before use.

Final performance in LFP/LMFP carbon precursors should be confirmed through the user's actual manufacturing, heat-treatment, and electrode evaluation results.