

CPS-LiPC

Ionic Interfacial Functional Material for Si/C & Activated Carbon Surface Coating

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 as an aqueous surface-coating material to form a thin and uniform functional interfacial layer on Si/C and activated-carbon particles, with application by Spray Drying and Blade Mill processes.

1. Purpose of Surface Coating Application

- Particle surface functionalization: Evaluates the potential for interfacial stabilization by forming a polar and ionic functional layer on Si/C or activated-carbon surfaces.
- Uniform thin-film coating: Utilizes the low-viscosity aqueous characteristics to form a thin and uniform coating layer on particle surfaces.
- Li⁺ transport and interfacial binding support: Evaluates the potential to improve ionic transport within the electrode and contact stability with binders/conductive additives through the coating layer.
- Process scalability: Designed for application in wet coating processes based on Spray Drying or Blade Mill processing.

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 · aqueous · particle surface functionalization	Si/C & activated-carbon surface coating material

3. Recommended Applications

Surface functionalization of Si/C anode materials and activated carbon — Dilute CPS-LiPP with DI water to 1–3 wt% solids and apply by Spray Drying or Blade Mill coating.

※ A coating-solution solids content of 1–3 wt% is recommended for initial process screening. Actual coating amount, spray conditions, milling conditions, and drying conditions should be optimized according to material characteristics and equipment.

4. Recommended Evaluation Design

Condition	Coating Solution Solids	Recommended Process	Primary Evaluation Objective
Control	0%	Uncoated	Baseline Properties/Cell Performance
Low concentration	1 wt%	Spray Drying / Blade Mill	Thin-film coating / dispersion
Medium concentration	2 wt%	Spray Drying / Blade Mill	Uniformity / interfacial functionality
High concentration	3 wt%	Spray Drying / Blade Mill	Effect of increased coating amount

5. Key Evaluation Items and Expected Effects

- Compare coating uniformity and surface morphology by SEM/TEM and, if necessary, EDS.
- Compare particle-size distribution, agglomeration, and powder flowability after processing.
- For Si/C application, compare ICE, C-rate performance, cycling, and electrode expansion behavior.
- For activated-carbon application, compare capacity/capacitance, ESR, high-rate performance, and cycle life.
- Evaluate the potential for improved interfacial binding and dispersion with binders/conductive additives through surface functionalization.

6. Process Guide

- Spray Drying : Dilute CPS-LiPC to a target solid content of **1–3 wt%**, uniformly mix it with the material slurry, and then spray-dry the mixture. For comparison, the existing spray-drying and drying conditions should be maintained whenever possible.
- Blade Mill: Gradually feed a 1–3 wt% solids CPS-LiPC aqueous solution to the material, perform uniform surface treatment, and then dry.
- It is recommended to apply the same downstream process as the uncoated control to isolate and compare the effect of the coating itself.

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 of Si/C and activated-carbon surface coating should be confirmed through the user's actual coating process, material analysis, and electrochemical evaluation.

