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Nanomanufacturing - Key control characteristics -
Part 4-11: Nano-enabled energy storage - Dispersion stability of nano-carbon materials for the electrodes of lithium-ion capacitors: zeta potential method

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Nanomanufacturing - Key control characteristics - Part 4-11: Nano-enabled energy storage - Dispersion stability of nano-carbon materials for the electrodes of lithium-ion capacitors: zeta potential method

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IEC TS 62607-4-11 has been prepared by IEC technical committee 113: Nanotechnology for electrotechnical products and systems. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
113/934/DTS	113/951/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,

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– revised.

INTRODUCTION

Zeta potential (ζ), a key parameter in colloidal dispersion systems, is defined as the potential difference between the slipping plane and dispersion medium. This potential reflects the interaction between charged particles in suspension and is directly influenced by the distance between the particle surface and the bulk fluid where the mobile phase interacts with the stationary fluid layer.

In industrial contexts, ζ serves as a critical measure for determining the stability of colloidal systems. Its utility extends across various sectors, such as pharmaceuticals, wastewater treatment, and food production, where the control of colloidal stability is essential for product performance. High ζ values typically indicate strong electrostatic repulsion between particles, minimizing aggregation and ensuring system stability. Conversely, low ζ values suggest a dominance of attractive forces, potentially leading to flocculation or coagulation.

Given its broad relevance, the method for measuring ζ has become indispensable in ensuring the quality and functionality of colloidal formulations. This document explores the principle of ζ and its measurement, while emphasizing its industrial applications and the associated requirements for different sectors.

1 Scope

This part of IEC 62607 specifies the dispersion stability by using the zeta potential (ζ) method for nano-carbon materials for lithium-ion capacitors. This document describes not only the dispersion stability of nano-carbon materials but also the effect of different surfactants as well as the evaluation method for testing long-term dispersion stability using ζ. This document describes:

– Dispersion stability of nano-carbon materials using ζ for lithium-ion capacitors using carbon nanomaterials as electrodes

– Effect of different surfactants

– Evaluation of long-term dispersion stability using the ζ method

2 Normative references

There are no normative references in this document.