Bundesanstalt für Materialforschung und -prüfung

REFERENCE MATERIAL DOCUMENT

REFERENCE MATERIAL BAM-N010

Hydrodynamic equivalent spherical diameter of polypropylene nanoparticles

Value(s)

Characteristic	Value in nm	Uncertainty U* in nm
Hydrodynamic equivalent spherical diameter	174	26

*Expanded uncertainties $U = k\, u_c$ were calculated according to ISO 33405:2024 [1] with a coverage factor $k=2$, providing a level of confidence of approximately 95%. The value of the combined standard uncertainty u_c of the property includes an uncertainty contribution resulting from the study of the homogeneity and stability of the material.

Additional Properties

The polydispersity index (PDI) is approximately 0.2, and the zeta potential is -38.5 mV with a standard deviation of 3.4 mV (n=10). The particle shape is slightly elongated and has a fractured surface structure.

End of Validity

This Reference Material Document is valid for 6 months after dispatch, provided that the reference material is stored under the recommended conditions.

Date of dispatch:

Material Description

BAM-N010 is filled in glass bottles containing 10 mL of an aqueous suspension of polypropylene nanoparticles.

Recommended Use

The purpose of the polypropylene nanoparticles is to assess and validate analytical techniques for the characterization of polymeric nanoparticles in aqueous environments.

Transport, storage, and handling

RM BAM-N010 can be shipped at room temperature. It should be stored in dark, dry conditions at ambient temperature in its original tightly sealed bottle. BAM cannot be responsible for changes that occur during storage at the customer's location, especially in open bottles. During transport, the packaging should be free of plastic to prevent contamination.

Literature

A detailed technical report describing the analysis procedures and the treatment of the analytical data used to characterize BAM-N010 is available on request or can be downloaded from BAM website (https://www.bam.de).
We refer to [1, 2] and references therein for a description of the current state of nanoplastics detection.

[1] Caldwell, J., Taladriz-Blanco, P., Lehner, R., Lubskyy, A., Ortuso, R. D., Rothen-Rutishauser, B. & Petri-Fink, A., The micro-, submicron-, and nanoplastic hunt: A review of detection methods for plastic particles, *Chemosphere,* 2022, *293*, 133514.

[2] Mitrano, D. M., Wick, P. & Nowack, B., Placing nanoplastics in the context of global plastic pollution, *Nature Nanotechnology,* 2021, *16*, 491–500.

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