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Analytical Reference Materials & PT by ZeptoMetrix®

FAQ
MICROPLASTICS REFERENCE MATERIALS

ZEPTOMETRIX FAQ COLLECTION

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Introduction

Concerns about microplastic pollution are globally recognized and understanding its impact on the environment and human health has never been more critical. To validate methods for monitoring and research, reliable microplastic reference materials are needed. ZeptoMetrix has introduced standardized microplastic reference materials MicroPRefs® through one of its brands, Chiron. Chiron brings 40 years of experience in creating unique and innovative organic reference materials and has developed the first microplastics reference materials.

This document aims to provide clear and concise answers to common questions about our microplastics reference materials and microplastics testing methodologies.

Q: What type of microplastic reference materials does ZeptoMetrix offer?

• Neat (powder) of common polymer types (PE, PP, PET, PS, PVC and PC) in the size range 50-300 µm for mass-determination through thermo-analytical methods.

• Soda tablets which include a known number of standardized microplastic particles for validation of particle counting using microscopy and vibrational spectroscopy methods. The number of particles per tablet is batch specific, and we aim for 30-60 particles per tablet.

Q: Why did you choose 50-300µm as the particle size range?

50-300 µm was chosen as a good starting point for microplastic reference materials because this size range covers a large proportion of the microplastic range and includes smaller particles.

Q: Are there technical issues with making a standard with a particle size ranging from 1 to 50 µm?

Yes, smaller particles are technically more difficult to produce, and there are even stricter demands for contamination control.

Q: How do the MicroPRefs® soda tablets work?

The soda tablets are user-friendly and designed to mimic an environmental sample for reliable inter- and intra-laboratory calibrations and validations to accurately identify and quantify microplastics in environmental samples using microscopy-, spectroscopy- and mass spectrometry-based methods.

Q: How to dissolve the tablet and ensure all particles are on the filter without loss?

The tablets are dissolved as described in our instruction for use. It can be provided upon request by filling this form.

Q: How does ZeptoMetrix ensure the highest quality of its microplastics reference materials?

As a part of our quality control and quality assurance, our products are analyzed using pyrolysis-GC/MS, TGA, analytical sieving, laser diffraction and microscopy. Our current Product Information Sheets (PIS) contain data from these analyses.

Q: Which instrument is best for analyzing microplastics?

Selecting the appropriate detection method for your project depends specifically on the objectives and tasks of that project.

We recommend looking into **"ISO 24187:2023 (en) – Principles for the analysis of microplastics present in the environment"** for more information on which instruments would be best for your purpose.

Q: Does ZeptoMetrix have a brochure or flyer including microplastic reference materials?

Yes! Here it is: Microplastics brochure

Q: Are there any ASTM methods for microplastics analysis?

There are several ASTM methods and work items for microplastic analysis:

• ASTM D8332 (2020): Standard Practice for Collection of Water Samples with High, Medium, or Low Suspended Solids for Identification and Quantification of Microplastic Particles and Fibers

• ASTM D8333 (2020): Standard Practice for Preparation of Water Samples with High, Medium, or Low Suspended Solids for Identification and Quantification of Microplastic Particles and Fibers Using Raman Spectroscopy, IR Spectroscopy, or Pyrolysis-GC/MS

• ASTM D8401 (2024): Standard Test Method for Identification of Polymer Type and Quantity of Microplastic Particles and Fibers in Waters with High to Low Suspended Solids Using Pyrolysis-Gas Chromatography/Mass Spectrometry

• ASTM WK87463(Work Item): New Test Method for Spectroscopic Identification and Quantification of Microplastic Particles in Water Using Infrared (IR) Spectroscopy

Q: Are there any ISO methods for microplastic analysis?

There are some ISO methods and drafts for microplastic analysis:

• ISO 24187:2023(en) Principles for the analysis of microplastics present in the environment

• ISO/DIS 5667-27(draft): Water quality — Sampling — Part 27: Guidance on sampling for microplastics in water

• ISO/DIS 16094-2 (draft): Water quality — Analysis of microplastic in water — Part 2: Vibrational spectroscopy methods for waters with low content of suspended solids including drinking water

• ISO/DIS 16094-3 (draft): Water quality — Analysis of microplastic in water — Part 3: Thermo-analytical methods for waters with low content of suspended solids including drinking water

Q: How is the uncertainty of particle numbers per tablet established?

The uncertainty value of the PIS is established by analyzing a statistically relevant number of tablets within a batch. The uncertainty value is the relative standard deviation within the tablet batch. It will be different from batch to batch.

Q: Does ZeptoMetrix calculate the Minimum Detectable Amount (MDA) in procedural controls?

Yes, we calculate the limit of detection (LOD) and the limit of quantification (LOQ).

Q: What do the particles look like?

Our current particles are irregularly shaped, mimicking environmental plastic samples. They are white to transparent in color.

Q: Since particles are irregularly shaped, how do you determine the particle size?

The particle size 50-300 µm is currently determined through sieve analysis. As the particles pass through a sieve mesh based on their shortest side, 50-300µm is based on the shortest size of the particle, also called Ferretmin or particle width.

In addition, our Product Information Sheets contain information on sizes determined through laser diffraction/static light scattering. In this technique, particle size distribution is reported. The reported size describes which size the particles would have been, if they were spherical.

Q: What are blank tablets used for?

Blank tablets are tablets without any polymers added. Tablets contain mostly excipients, and results of dissolved excipients will be individual to each analytical setup. Blank tablets thereby validate the matrix of the polymer tablets. We recommend analyzing one blank per series of tablets used.

Q: Where can ILC reports be found?

1. https://doi.org/10.1016/j.scitotenv.2021.145071
2. https://doi.org/10.1007/s00216-023-04636-4
3. https://www.norman-network.net/sites/default/files/files/QA-QC%20Issues/Report%20Microplastics%20ILS%20study%20QUASIMEME%202020.pdf

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