VAMAS

Polymer Nanocomposites
Technical Work Area 33

Project 1

Determination of the shape, size and size distribution of nano-filler particles

Objectives

The project aims to develop pre-standardized experimental procedures for determination of size, shape and size distribution of clay nanoparticles. These include protocols on clay exfoliation into individual platelets, image acquisition by SEM and AFM techniques, and image processing.

Proposed activities include the preparation and realization of a round robin with the objective to obtain laboratory reproducibility of the dimensional measurement of clay nanoparticles using the developed protocols.

Background and Standardization needs

The worldwide use of Polymer Nanocomposites (PNC) in diverse industries (e.g. transportation, packaging, surface treatment) is already large and it is growing rapidly. However, there are no internationally recognized standards for PNC testing.

The design of nanoparticles is critical for nanocomposite structure, and careful characterization of nanoparticle morphology is required to design a product.

The main goal of the project is to standardize the essential experimental test methods for nano-fillers.

Work Programme

Development of the method of clay characterization will proceed in following stages:

1. Production of a batch of exfoliated clay nanoparticles on Si substrates and its characterization through homogeneity and stability studies.
2. Distribution of exfoliated and not exfoliated clay samples between round robin participants.
3. Dimensional measurement of clay samples by participants using provided protocols.
4. Refinement of protocols based on the results from the round robin

Call for Participation

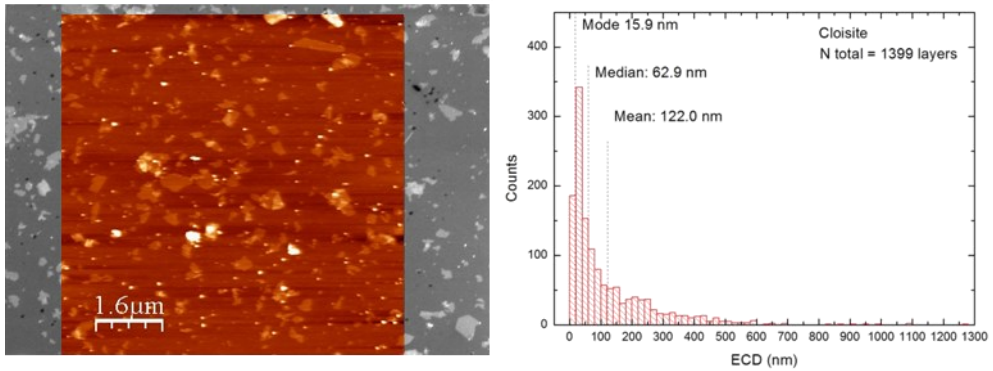

Figure 1: Overlapped SEM and AFM micrographs of Somasif ME-100 platelets with the size distribution of their equivalent circular diameter

Deliverables and Dissemination

- Development of experimental methods for the nano-filler characterization,
- VAMAS Technical Report,
- Publications in scientific journals,
- ISO TC 229 links aimed at development of an ISO standard.

Funding

Participation is based on in-kind contributions from the partners.

Status

Production of a batch of exfoliated clay samples is currently in progress. Call for additional participants.

For more information on participation, please contact:

Dr. Oleksii KUZNETSOV
VAMAS TWA 33, Co-Chair
National Institute of Metrology, Quality and Technilogy, INMETRO, Brazil
Email: okuznetsov@inmetro.gov.br

Dr. Norma GONZÁLEZ-ROJANO
VAMAS TWA 33, Co-Chair
Centro Nacional de Metrologia, CENAM, Mexico
Email: ngonzale@cenam.mx

Prof. Dr. Yoshito MITANI
VAMAS Steering Committee Coordinator, TWA 33
Centro Nacional de Metrologia, CENAM, Mexico
Email: ymitani@cenam.mx

www.vamas.org

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