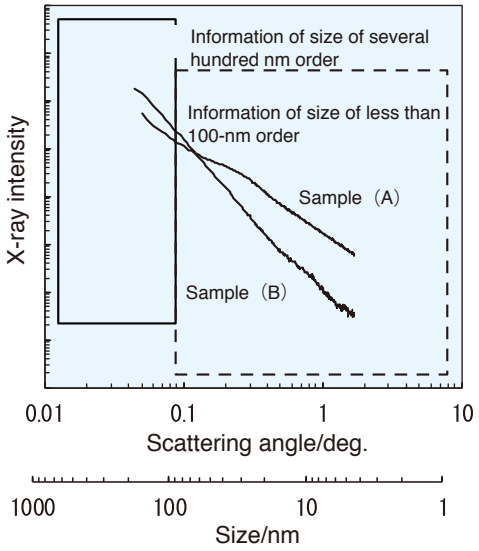
Evaluation of Nanocomposite Materials -X-ray Analysis and Electron Microscope-

Nanocomposite materials are attracting attention as materials for use for the purpose of reducing the weight of automobiles, aircraft, etc. The dispersion state of the fillers at nano levels, an important factor in determining the properties of the materials can be evaluated by means of X-ray analysis and the electron microscope, among other things.

Examples of samples: Nonofiller/polymer-based composite materials

Analysis example 1: X-ray analysis: Small angle X-ray scattering (SAXA) measurement



Nano-level Information on the whole of a sample can be analyzed and evaluated by means of small angle X-ray scattering (SAXS).

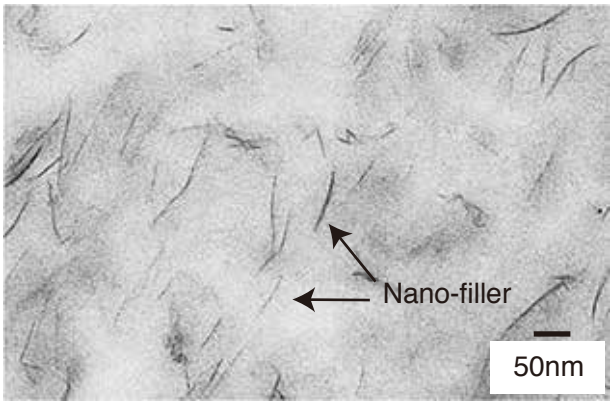
【Sample (A)】
Corresponds to size of less than 100-nm order
High X-ray intensity

⇒Nono-fillers are dispersed to size of less than 100-nm level..
(Nanocomposite materials)

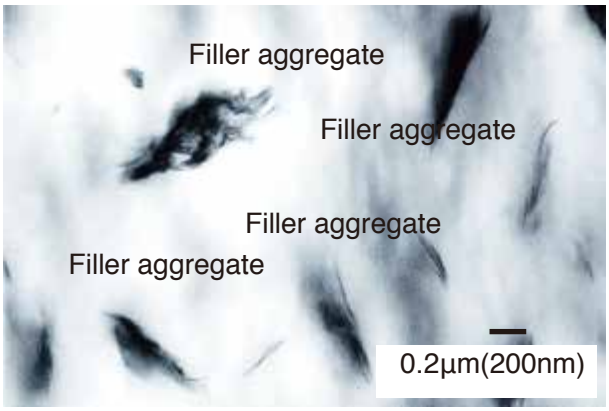
【Sample (B)】
Corresponds to size of several hundred-nm order
High X-ray intensity

⇒Fillers are dispersed to size of several hundred-nmlevel..

Analysis example 2: Electron microscope: Transmission electron microscope (TEM)



Sample (A): Nano-fillers (black) are dispersed in the polymer at less than 100-nm level.



Sample (B): Nano-fillers are dispersed as filler aggregates in the polymer at several hundred-nm level.

Dispersion state of the nano-fillers can be observed by use of the transmission electron microscope.

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