

Particle Characterisation: Which Technique?

Introduction

When faced with what is thought to be a particle sizing issue the question arises of what technique is best employed to confirm this. Below are some guidelines that may help in the process. The following techniques are available in Intertek MSG.

- Laser diffraction (LALLS – Beckman Coulter LS230 instrument)
- PCCS (Photon cross correlation spectroscopy - a modern development of PCS or DLS)
- CPS Disc Centrifuge (24,000 rpm max operating speed)
- Optical Microscopes/ TEM/ FEG SEM plus image analysis
- Sieving

Is it a dry powder with all the particles >5 microns in diameter?	<u>Laser diffraction</u> is probably the best technique. Measures dry powders from 0.4 microns to 2 mm
Is it a liquid dispersion but with large particles (>10 microns) present?	<u>Laser diffraction</u> is probably the best technique. Measures dispersions from 40 nm to 2 mm
Is it a nano-dispersion with particles below 500 nm?	Any of the three techniques could be used
Is it a mono-modal nano-dispersion with particles below 500 nm?	PCCS would be used in the first instance here. Measures from 2 nm upwards. PCCS also gives information on dispersion stability.
Is it a multi-modal nano-dispersion that needs to be analysed in high resolution?	The disc centrifuge would be the technique of choice here. Measures from about 5-10 nm to 10 microns in very high resolution.
Is particle shape possibly an important issue?	Only image analysis of images produced microscopically gives statistical information on particle shape.
Does the size distribution extend above 2 mm?	Sieving is a possibility here but also is imaging using a camera fitted with a lens followed by image analysis to get statistical size information.

To discuss particle sizing/shape issues, contact Jonathan Whitehead: telephone +44 (0) 1642 435708, e-mail jonathan.whitehead@intertek.com

For general enquiries about Intertek MSG, contact Dr Allan Stewart by the following means.

Telephone: +44 (0)1642 435788 or
Email msgenquiry@intertek.com

Intertek MSG
 The Wilton Centre, Redcar, UK, TS10 4RF