

# Sizing up Dispersions



Products as diverse as cosmetics, paints and inks, drugs and polymer latexes all depend upon the dispersion of particles in a liquid phase. To produce these colloidal dispersions accurately and ensure that they perform according to specification, particle size needs to be monitored during manufacturing and as part of quality control of the final product. A technique that quickly and accurately determines particle size is dynamic light scattering (DLS), and Brookhaven Instruments Corporation was one of

the first companies to develop a particle sizing instrument based on this technique. Today, the 90Plus Particle Sizer is one of the company's most popular instruments.

Increasing quality control throughput is the primary reason why Geoff Lowther, quality controller at the Jarrow Plant of Rohm and Haas, Tyne and Wear has a 90Plus system. Geoff is responsible for checking the particle size of emulsion copolymers made from monomers as butyl acrylate, ethyl acrylate and styrene and he explains: "These emulsions are made in aqueous suspension with added surfactants. Particle size determination is important as each product we make has an individual specification and the particle size distribution must fall within narrow limits. The 90Plus system is easy to use and we can customize reports on it quickly. It makes our lives much easier."

Particle size is also an important parameter in the development of new polymers, something the Department of Chemistry at the University of Cyprus needs to assess if methacrylate polymers have potential as drug delivery systems. The 90Plus system has allowed the laboratory to determine the micellar hydrodynamic sizes of methacrylate polymers in water and organic solvents, allowing amphiphilic block copolymer-based networks to be compared for size and performance.

Finally, it is not just the instrument's particle sizing ability that impresses its users. The flexibility to upgrade or add other features, such as a zeta potential option and high power lasers for weakly scattering particles, also rates highly with them. One such user is Charanjit Saini, a graduate polymer chemist in the polymer chemistry department at the Dionex Corporation, California. The department's existing instrument was upgraded to a 90Plus system so the particle size and polydispersity of latexes used to produce chromatographic stationary phases could be determined. The upgraded system has a BI-Zeta option and a BI-SM50 small volume cell, which allows the amount of sample Charanjit used to be reduced from 2-3 ml to just 50  $\mu$ l.

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