

OPTOKEM INSTRUMENTS LTD.

Pistyll Farm, Nercwys, Clwyd. CH7 4EW.

Tel. +44 (0)1352 705200

Fax +44 (0)1352 705201

FIELD FLOW FRACTIONATION/LIGHT SCATTERING FOR ABSOLUTE PARTICLE & MACROMOLECULE CHARACTERISATION

Author: **Dr Roger J. White, Optokem Instruments Ltd**

Abstract:

The most accurate characterisation of sub micron particles in suspension is achieved by examining them one at a time within a well defined microscopic field. Many types of particles are painstakingly measured this way by Transmission Electron Microscopy (TEM) to establish sizing standards by which the properties of other unknown samples may be estimated. An alternative, accurate, and far easier approach in which particles are first separated according to their size then measured by multi-angle laser light scattering (MALLS) has recently been developed.

Using a technique developed by Prof. Calvin Giddings of the University of Utah known as Field Flow Fractionation, microparticulate sample suspensions in the size range 5nm - 100µm, may be separated in a manner similar to the separation of molecules within a Size Exclusion Chromatography column. Immediately after fractionation, the separated particles flow through a DAWN DSP MALLS detector where they are measured sequentially to yield an absolute size for each eluting fraction. Once the number or mass concentration of each fraction (slice) is known, the size distribution of the sample can be derived.

This poster will outline the theory & operation of Field Flow Fractionation, as well as the method of sizing using multi-angle light scattering. Examples of typical applications of relevance to the analysis of polymer colloids will be presented. It will conclude with a comparison between FFF/MALLS and other sizing techniques including TEM, and Photon Correlation Spectroscopy (PCS).