

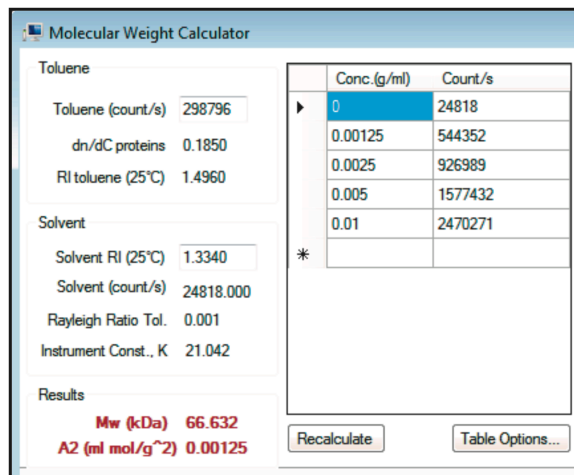
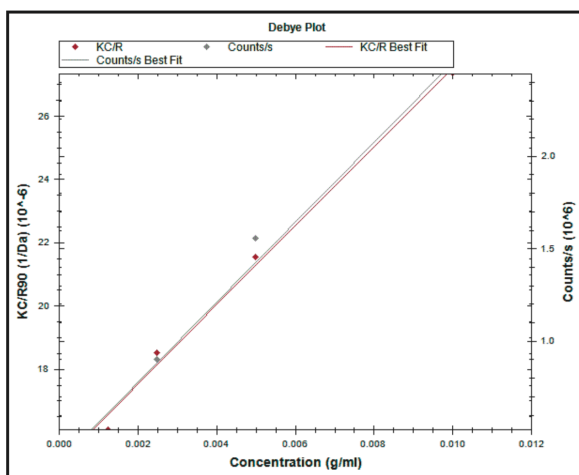
Measuring Molecular Weight With the pUNK

Background: Laser light scattering theory predicts that when a molecule is much smaller in size than the incident laser wavelength, there is very little angle dependence in the measurement and it is therefore possible to accurately measure molecular weight using a single scattering angle. The Molecular Weight Calculator feature of i-Size provides this useful facility and is based on the theory given by the Rayleigh equation for molecular weight measurement.

$$\frac{KC}{R_{\theta}} = \left(\frac{1}{M_w} + 2A_2C \right) P(\theta)$$

Measurement Procedure: A series of concentrations is injected manually through a flow cell placed in the sample holder of the W130i DLS system. Starting with pure solvent, followed by each increasing concentration the sample scattering intensities are recorded using i-Size software.

Results: The time averaged scattering intensities and sample concentrations are entered into the Molecular Weight Calculator together with the solvent refractive index and count rate measured from a toluene reference standard. A Debye plot is produced and the molecular weight, Mw and 2nd Virial Coefficient, A2 are displayed in red.



Summary: The pUNK DLS system can be used to accurately measure molecular weight of proteins in solution. The same DLS system can also produce quick and accurate measurements of molecular size and aggregation state utilizing Unchained Labs unique disposable 5µl BladeCell cuvettes.