The second virial coefficient for lysozyme solutions was measured using static light scattering experiments on concentration series of dilute solutions of lysozyme. The light scattering experiments were performed with a commercial goniometer system (ALV/DLS/SLS-5000F mono-mode fiber compact goniometer system with ALV-5000 fast correlator) at a wavelength of 514.5 nm and a fixed scattering angle of 90°, leading to a scattering vector \( q = 0.0222 \text{nm}^{-1} \). For small globular proteins such as lysozyme this procedure is accurate since the entire \( q \)-range accessible with light scattering is in the Rayleigh regime, where the scattered intensity is \( q \)-independent. The data were corrected for background (cell and solvent) and converted into absolute scattering intensities - the Rayleigh ratios - using toluene as a reference standard. The refractive indices necessary for calculating the contrast term, which is given by

\[
K = \left( \frac{2n_0 \pi N A}{\lambda} \right)^2
\]

with \( n_0 \) the index of refraction of the buffer, \( dn/dc \) the refractive index increment, and \( \lambda \) the wavelength of the scattered light in vacuum, were determined for all solutions with an Abbe refractometer by measuring at three different wavelengths and extrapolating the thus obtained values to 514.5 nm. The resulting refractive index increment, \( dn/dc = 0.194 \text{mL/g} \), was found to be temperature and salt independent within an error of 2%. Samples were centrifuged for 20 minutes at 6000 \( g \) to get rid of any dust particles and carefully checked to avoid crystallization during the measurement. The resulting value for the molecular weight was in agreement with the literature value of 14.4 kDa. 

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note that for all salt concentrations investigated, the $B_2/B_2^{HS}$ values at $T_c$ are $B_2^* = -2.55 \pm 0.12$, identical within experimental errors irrespective of ionic strength.

**References**