

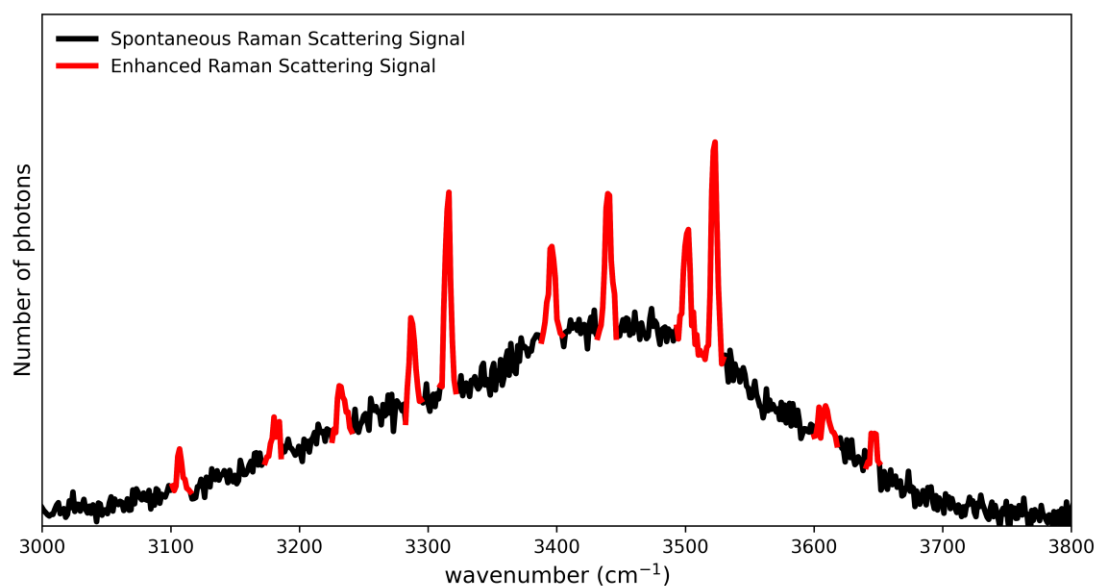


Figure S1. Schematic diagram of whispering gallery modes

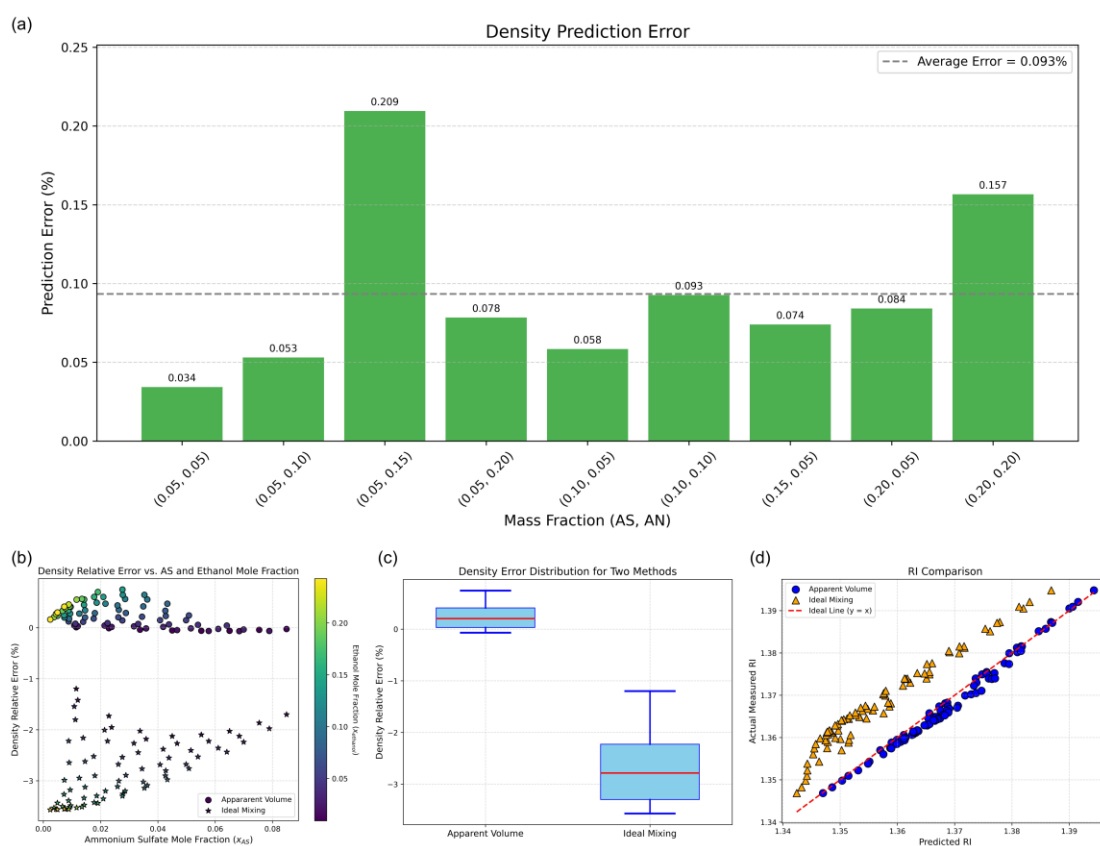


Figure S2. Density and refractive index of mixed solutions calculated using the apparent molar volume method and the molar refraction method. (a) Density error of ammonium sulfate–ammonium nitrate mixtures at different mass fractions calculated by the apparent molar volume method, with a mean error of <1%. (b) Comparison of densities of ammonium sulfate–ethanol mixtures calculated using the apparent molar volume method and the ideal mixing density assumption. (c) Boxplots of density errors from the two methods. (d) Comparison of measured refractive indices with values calculated by the

molar refraction method using densities from the two approaches.

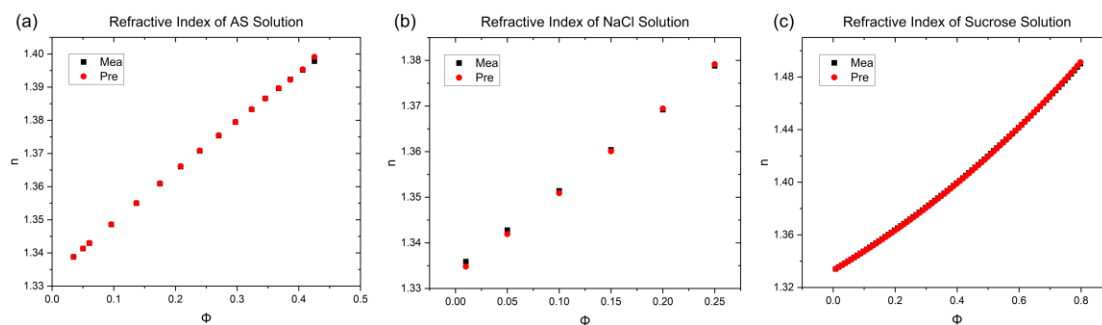


Figure S3. Retrieval of solute molar refraction using refractive indices of solutions at different mass fractions as constraints: (a) ammonium sulfate, (b) sodium chloride, and (c) sucrose.

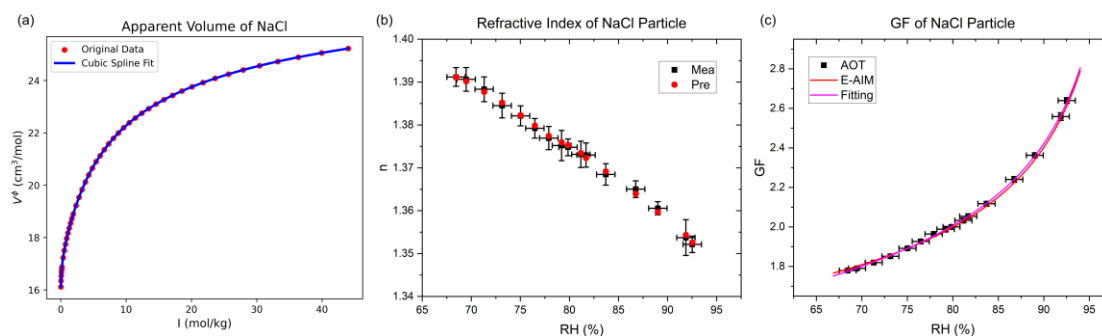


Figure S4. Measurement of sodium chloride hygroscopicity. (a) Apparent molar volume of NaCl as a function of ionic strength. (b) Measured refractive index and corresponding values derived from the constrained solute mass. (c) Hygroscopic growth factors of NaCl particles, together with the fitted growth curve and the E-AIM prediction.