

Abstract Submitted
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Aqueous ammonium thiocyanate solutions as refractive index-matching fluids with low density and viscosity¹ BENJAMIN C. MORRISON, DANIEL BORRERO-ECHEVERRY, Reed College — Index-matching fluids play an important role in many fluid dynamics experiments, particularly those involving particle tracking, as they can be used to minimize errors due to distortion from the refraction of light across interfaces of the apparatus. Common index-matching fluids, such as sodium iodide solutions or mineral oils, often have densities or viscosities very different from those of water. This can make them undesirable for use as a working fluid when using commercially available tracer particles or at high Reynolds numbers. A solution of ammonium thiocyanate (NH_4SCN) can be used for index-matching common materials such as borosilicate glass and acrylic, and has material properties similar to those of water ($\nu \sim 1.6$ cSt and $\rho \sim 1.1$ g/cc). We present an empirical model for predicting the refractive index of aqueous NH_4SCN solutions as a function of temperature and NH_4SCN concentration that allows experimenters to develop refractive index matching solutions for various common materials.

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