Ab Initio Calculation of Thermophysical Properties of Helium

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We report the thermophysical properties of helium calculated from recent *ab initio* interatomic potentials. We use the small differences between various approximations to the *ab initio* potentials and the calculated sensitivity of the thermophysical properties to these small differences to estimate the uncertainties in the calculated properties. Finally, we present, in a user friendly form, results for the second virial coefficient, the viscosity, the thermal conductivity, and the mutual diffusion coefficient. Under many conditions, the calculated properties appear to be more accurate than very high quality measurements. Thus, the calculated properties could be used to calibrate apparatus used to measure thermophysical properties.