

## Speed of Sound Measurements in Liquid *n*-Heptane and 2,2,4-Trimethylpentane (Isooctane)

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The definition of the octane rating of gasoline fuels for assessing the knock resistance in internal combustion engines is based on binary mixtures of the liquid alkanes *n*-heptane and 2,2,4-trimethylpentane (isooctane). For this application, the thermodynamic properties of pure *n*-heptane, pure 2,2,4-trimethylpentane, and their binary mixtures must be known accurately. While some extensive data sets for the speed of sound in *n*-heptane can be found in the literature, only few data are available for isooctane at high pressures. With the present study, we provide in a first step comprehensive and accurate speed of sound data in the liquid region of both pure alkanes in the temperature range between 200 K and 420 K with pressures up to 100 MPa. The expanded ( $k=2$ ) uncertainties of our data are 2.5 mK in temperature, 0.005 % in pressure, and 0.015 % in speed of sound. Comparisons of our data with the current reference equations of state and data of other authors from the literature for both fluids prove the high accuracy of our measurements.