

Thermodynamic Characterization of (H₂ +iC₄H₁₀) for Flow Metering Applications

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Despite the availability of AGA8 and GERG-2008 international standards, the calculation of the thermodynamic properties of natural gas is unsuitable for flow metering operations when the content of hydrogen exceeds 10 mol%, due to the expected uncertainty affecting the predictions. International standardization bodies are working to update the standards on the basis of newly available experimental measurements specifically carried out to solve this problem. In this work, preliminary measurements of density and speed of sound, obtained in the binary mixtures of H₂ and iso-butane, have been fitted to implement a virial equation. The equation has been developed privileging its simplicity so that its validity is limited to the temperature range from 263 K to 333 K and for pressures up to 7 MPa; however, it is optimized for flow metering applications.