

Measurements of the Isochoric Heat Capacity for CO₂-CH₄ Binary Mixtures at Temperatures from 226 K-266 K and Pressures up to 20 MPa

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To meet the demands for experimental thermophysical data on methane-carbon dioxide mixtures, an adiabatic calorimeter was used to measure the isochoric specific heat capacity. Data was collected over a temperature range of 226 K to 266 K and a pressure range of 14 MPa to 20 MPa. The standard uncertainties were estimated at 12 mK for temperature, 5000 Pa for pressure, and 1.2% for heat capacity. Comparing the experimental results with the Peng-Robinson model, the Redlich-Kwong model, and the GERG-08 model showed good agreement, with the PR model exhibiting the highest accuracy with an AARD of 1.95%. This study provides valuable insights into the thermophysical properties of the mixture.