

Accepted Manuscript

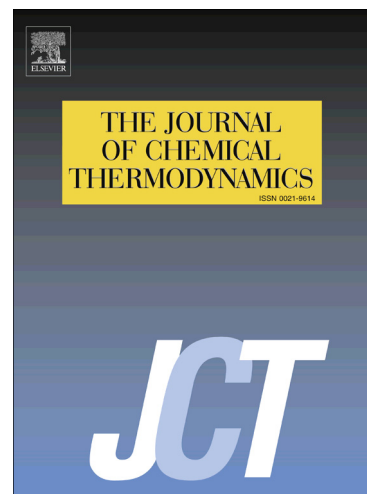
Speed of sound as a function of temperature and pressure for propane derivatives

Francisco Yebra, Katerina Zemánková, Jacobo Troncoso

PII: S0021-9614(16)30408-6
DOI: <http://dx.doi.org/10.1016/j.jct.2016.12.016>
Reference: YJCHT 4927

To appear in: *J. Chem. Thermodynamics*

Received Date: 30 June 2016
Revised Date: 15 November 2016
Accepted Date: 16 December 2016



Please cite this article as: F. Yebra, K. Zemánková, J. Troncoso, Speed of sound as a function of temperature and pressure for propane derivatives, *J. Chem. Thermodynamics* (2016), doi: <http://dx.doi.org/10.1016/j.jct.2016.12.016>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Speed of sound as a function of temperature and pressure for propane derivatives

Francisco Yebra,^{a, b} Katerina Zemánková,^a Jacobo Troncoso^{a, *}

^aUniversidad de Vigo, Departamento de Física Aplicada, Edificio Manuel Martínez Risco, Campus del Agua, 32004 Ourense, Spain.

^bLaboratorio Oficial de Metroloxía de Galicia (Consellería de Economía, Emprego e Industria) Av. de Galicia 1,3. Parque Tecnolóxico de Galicia. San Ciprián de Viñas. 32901 Ourense, Spain.

*To whom correspondence should be addressed.

Abstract

The speed of sound in the temperature and pressure interval (283.15 – 343.15) K and (0.1 – 95) MPa was measured for nitropropane, propionitrile, 1,2 dichloropropane, 1,3 dichloropropane, propylamine and propionic acid. An apparatus based on the acoustic wave time of flight determination, with a fully automatized temperature and pressure control, was used to this aim. The speed of sound derivatives against temperature and pressure, as well as the nonlinear acoustic coefficient were obtained from experimental values. The results are analyzed and compared with previously reported data for other propane derivatives: propane, 1-propanol, propanone, d-propanone, and several fluoropropanes. All obtained magnitudes are rationalized basing on the physicochemical properties of these fluids. Nearness to critical point and molar mass are revealed as key factors as regards the speed of sound behavior against temperature and pressure.

Keywords: Speed of sound, pressure, propane derivatives, nonlinear acoustic coefficient, critical point.

Download English Version:

<https://daneshyari.com/en/article/4907353>

Download Persian Version:

<https://daneshyari.com/article/4907353>

[Daneshyari.com](https://daneshyari.com)