HIGH-PRESSURE DENSITY OF THE BINARY SYSTEM
DIMETHYL CARBONATE + n-OCTANE

ANA GAYOL1, MARTA M. MATO1*, LIDIA CASÁS2, JOSÉ LUIS LEGIDO1
1Department of Applied Physics, University of Vigo, Campus As Lagoas Marcosende s/n, 36310 Vigo, España.
2Laboratoire de Thermique, Energétique et Procédés (LaTEP), ENSGTI – UPPA, Rue Jules Ferry - BP 7511, 64075 PAU Cedex – France.
e-mail: fammmcm@uvigo.es

Introduction
The dimethyl carbonates are useful organic solvents for the chemical industry [1,2]. Moreover, these molecules with base carbonate and containing an aromatic and an aliphatic parts have an important industrial interest as gasoline additives and as lubricants in the replacement of CFCs (chlorofluorocarbons) [3]. These industrial uses are the reason why there has been considerable upsurge in the theoretical and experimental investigations of dimethylcarbonates and of their mixtures with other compounds [4]. This work presents a PVT study for dimethyl carbonate and n-octane pure components and their binary mixture (dimethyl carbonate + n-octane) in the temperature range of (288.15 – 308.15) K and pressures between (0.1 and 40) MPa. The experimental density values were compared with experimental information available in the literature [5-9]. The purpose of this study is to extend the available experimental information about the thermophysical behaviour of this binary system, which is useful in fuel field.

A modified Tait equation [10] has been used in order to fit the density values and to obtain the derived properties such as isothermal compressibility coefficient, isobaric thermal expansivity coefficient and internal pressure. Besides, the ability of the Nitta–Chao [11] model for the prediction of density values and derived properties for these mixtures had been tested.

Material and Methods
The binary mixtures were prepared by mass using a Mettler AE-240 balance, the materials had been previously degassing.

The density was measured with an Anton Paar DMA 512 P/60 vibrating-tube densimeter connected to an Anton Paar DMA 4500 data acquisition unit.

References

Results and discussion

Conclusions
Nitta-Chao group contribution model describes correctly the high pressure density and their derivate properties such as isobaric thermal expansivity coefficient, isothermal compressibility coefficient and internal pressure of the pure components and the dimethyl carbonate + n-octane binary mixture.

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