

Density, Refractive Index and Thermal Conductivity of [C₂mim][C₇H₁₅COO] + H₂O Mixtures

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Out of many applications of ionic liquids, one of the most interesting is that related to their properties as a solvent for cellulose processing and fibre production [1]. According to circular economy demands, cellulose as a cheap and available feedstock for the production of chemicals and fuels (including bio-), can give origin to truly sustainable products, if their production is also sustainable. Ionic liquids, as promising sustainable solvents, can be used for this effort. Although [C₂mim][CH₃COO] is the ionic liquid often used in these type of application, as described in our previous work [2], and already used by 3M Company [3], it seems that [C₂mim][C₇H₁₅COO] is a promising material, with some advantages, namely in the fibre industry [4].

In the current work we report some thermophysical properties for pure [C₂mim][C₇H₁₅COO] and for its aqueous mixtures, in the whole composition range, namely density, thermal conductivity and refractive index, from 283 K to 343 K.

Density and speed of sound were measured using an Anton Paar density and sound velocity meter DSA 5000 M, while the thermal conductivity was measured with the TPSYS02 thermal conductivity measurement system, employing a TP08 non-steady-state probe based on the transient hot-wire method (THW) and manufactured by Hukseflux Thermal Sensors B.V. The refractive index measurements for the sodium D-line were made with an Anton Parr Abbemat 500 refractometer. Results obtained will be compared with the properties of the [C₂mim][CH₃COO] aqueous system and the system ability to be used in these green resources applications discussed.

References

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