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# Aliphatic and aromatic hydrocarbon diffusion coefficients at infinite dilution in [emim][DCA] and [4empy][$Tf_2N$] ionic liquids

Noemí Delgado-Mellado, Miguel Ayuso, Julián García *, Francisco Rodríguez

*Department of Chemical Engineering, Complutense University of Madrid, E, –28040 Madrid, Spain*

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ABSTRACT

In this work the diffusion coefficients at infinite dilution of eight aromatic and aliphatic hydrocarbons (*n*-hexane, *n*-heptane, *n*-octane, *n*-nonane, benzene, toluene, *p*-xylene, and ethylbenzene) in 1-ethyl-3-methylimidazolium dicyanamide ([emim][DCA]) and 1-ethyl-4-methylpyridinium bis(trifluoromethylsulfonyl)imide ([4empy][$Tf_2N$]) ionic liquids (ILs) at (298.2–333.2) K have been measured using the Taylor dispersion technique. First, three well-known systems, namely *n*-hexane, *n*-octane, and toluene at infinite dilution in *n*-heptane, have been studied to assure the reliability of the experimental equipment and to set the operational conditions which comply with the requirements for the Taylor dispersion technique. From the data obtained, it has been shown that the hydrocarbon diffusion is slower in ILs than in hydrocarbons because of the higher solvent viscosity. In the same way, hydrocarbon diffusion coefficients in [emim][DCA] presented a high value than in [4empy][$Tf_2N$]. Given the large deviation in the coefficient diffusion predicted by the Wilke-Chang correlation, a different correlation has been proposed to estimate them at the studied temperature interval. The modified Wilke-Chang equation satisfactorily represented the present experimental data.



* Corresponding author.
*E-mail address:* jgarcia@quim.ucm.es (J. García).

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