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## Influence of the alkyl chain length on densities and volumetric properties of 1,3-dialkylimidazolium bromide ionic liquids and their aqueous solutions

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**Abstract:** In this manuscript eight new 1,3-dialkylimidazolium bromide ionic liquids,  $[C_nC_m\text{im}][\text{Br}]$ , were synthesized and characterized. Densities of ionic liquids and their diluted aqueous solutions have been measured over the whole composition range at selected temperatures from (293.15 to 323.15) K and at atmospheric pressure ( $p = 0.1$  MPa). Influence of alkyl chain length and cation symmetry on densities and volumetric properties as well as nature of the interactions in aqueous  $[C_nC_m\text{im}][\text{Br}]$  solutions have been discussed and compared with previously published aqueous  $[C_2C_4\text{im}][\text{Br}]$  system. Densities of pure bromide based ionic liquids decrease with increasing alkyl chain length on imidazolium cation and depend on total number of methyl group in both side alkyl chains. Apparent molar volumes at infinite dilution of investigated ionic liquids in water increase linearly with increase of the total number of the C atoms in the side alkyl chain.

**Keywords:** Ionic liquids; Volumetric properties; Density; Imidazolium; Alkyl chain length.

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