

Critical Properties of Some Aromatic Compounds

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In this paper, we report the critical temperatures and pressures of 21 aromatic compounds that belong to the following families: phenylalkanoic acids, phenylalcohols, and phthalates. We have investigated six phenylalkanoic acids from phenylethanoic to 7-phenylheptanoic acid, phenylalcohols from phenol to benzenebutanol, and 11 phthalates with straight side alkyl chains from dimethyl to diundecyl phthalates and bis(2-ethylhexyl) phthalate. Two factors stimulated our interest in these substances. First, they are widely used in various applications. Several million tons of phthalates are produced worldwide per year. Second, the well-known group-contribution methods [1, 2] work, as a rule, worse for aromatic compounds than for aliphatic ones because of the comparatively small amount of experimentally determined critical properties of aromatic compounds. All the substances investigated are thermally unstable ones, i.e. their decomposition begins at temperatures that are lower than their critical temperatures. The pulse-heating method [3] has been used for measuring critical properties. The residence times were from 0.02 to 1.0 ms. The experimental values of the critical temperature and pressure have been compared with those predicted using the group-contribution methods by Constantinou and Gani [1] and Marrero and Gani [2].

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