Density calculation of liquid organic compounds using a simple equation of state up to high pressures - DTU Orbit (23/12/2018)

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Experimental densities of three groups of liquid organic substances (acids, esters, alcohols) have been correlated using Goharshadi–Morsali–Abbaspour (GMA) equation of state and then the values calculated from the equation of state have been compared with the experimental data. The paper reports new correlation for the density of 20 organic liquids (7 acids, 7 esters and 6 alcohols) at temperatures between 293.15K and 393.15K and pressures between 0.1MPa and 35MPa. A comparison with experimental data in the specified range of temperature from low to high pressures has been made. Some generalized correlations are also used for comparison with GMA equation of state and experimental data. The results show that the equation of state reproduces the experimental PρT data of liquid organic compounds with good accuracy. The excellent agreement with experimental data indicates that this equation of state can be used to calculate the density of liquid organic compounds with a high degree of certainty. The comparison with other correlations shows that the GMA equation of state is better to some extent and reliable in the given temperature and pressure range.

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