Viscosity Equations for o- Xylene, m- Xylene and p-Xylene

Fali Cao [S], Xianyang Meng and Jiangtao Wu [C]
Key Laboratory of Thermo-Fluid Science and Engineering, Xi'an Jiaotong University, Xi'an, Shaanxi, China
jtwu@mail.xjtu.edu.cn

O-xylene(o-C6H4(CH3)2), m-xylene(m-C6H4(CH3)2) and p-xylene(p-C6H4(CH3)2) are isomers in structure. They are not only important organic chemical raw materials but also widely used as solvent or synthesizing monomers in many fields, such as chemical industry, paint, medicine and so on. Viscosity is the fundamental thermophysical property of fluids. Within the energy and chemical industry, the viscosity equation over wide range of temperatures and pressures is very important, not only for science but engineering. However, the viscosity equations for o-xylene, m-xylene and p-xylene have not been developed so far. In this work, the available experimental viscosity data were screener sort through the published literatures and the viscosity equations for o-xylene, m-xylene and p-xylene were developed by the nonlinear fitting algorithm based on the Levenberg-Marquardt algorithm. All the three viscosity equations were expressed as the sum of two parts: the dilute-gas region and the residual region. The viscosity equation for o-xylene (m-xylene, p-xylene) is valid for temperatures from triple point to 400K (650K, 500K) with pressures up to 300MPa (240MPa, 280MPa). The uncertainties of properties calculated with the new equations in viscosity were evaluated reasonably. The behaviors of the equations were also assessed within the region of validity and at higher temperatures and pressures.