

Reference Correlation of the Viscosity of Ethene from the Triple Point to 580 K and up to 200 MPa

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Ethene (IUPAC name), ASHRAE R-1150, CAS reg. No 74-85-1, also known as ethylene, is a hydrocarbon with the molecular formula C_2H_4 . It is a colorless, flammable gas with a faint odor when pure. Ethene is widely used in the chemical industry, mostly in the production of polyethylene in various chain lengths.

The most recent viscosity correlation was developed in 1983 by Holland et al. [1]. Since then there have been several developments:

- new high-pressure measurements [2] in 1987, as well as low-temperature ones [3] in 2023, have been published.
- In 1987, a new very accurate, theoretically based, low-pressure viscosity correlation for ethene was published by Boushehri et al. [4], and
- in 2000, a new equation of state was published (Smukala et al. [5]).

Therefore, a new more accurate correlation for the viscosity of ethene can now be derived. We use an analysis based on the best available experimental viscosity data. First it is necessary to perform a critical assessment of the experimental data. Two classes of data are defined - primary and secondary data. Primary data are used in the development of the correlation, while secondary data are used only for comparison purposes. The viscosity correlation is valid from the triple point to 580 K and up to 200 MPa pressure. Since there are available data in the critical region, a correlation term is also included for the critical enhancement.

References

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