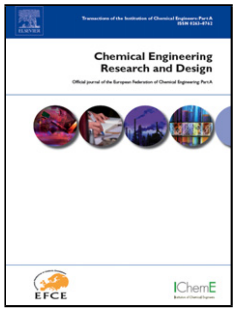

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Genetic Programming (GP) Approach for Prediction of Supercritical CO_2 Thermal Conductivity

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Highlights

GP technique is applied to estimate the supercritical CO_2 thermal conductivity

A comprehensive databank from literature was used for modeling purpose

The results of proposed model were compared to published correlations in literature

The results showed the supremacy of the proposed GP model over other correlations

Abstract

Gas thermal conductivity is one of the thermophysical properties that inevitably enters into mathematical models of real systems used in the design of chemical engineering processes or in the gas industry. In this study, via implementing a powerful and newly applied equation generator algorithm known as, genetic programing (GP) mathematical strategy, a novel correlation for estimation of supercritical CO_2 thermal conductivity is established. The proposed correlation is developed and validated based on a comprehensive databank of 752 thermal conductivity datasets from open literature. By using various statistical quality measures, the result of the proposed GP model was compared with commonly used literature