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Estimation on global reaction heat for the aromatization process of liquefied petroleum gas

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The reaction heat effect analysis for the aromatization process of Liquefied Petroleum Gas (LPG) was completed in this paper. In order to characterize this complex reaction system, one set of independent reactions was determined by means of atomic coefficient matrix method. Based on reaction thermodynamic and stoichiometric knowledge, the heat effect, Gibbs free energy change and equilibrium constant for each independent reaction was calculated under the specified conditions. Under these conditions, based on the initial and final composition data from LPG aromatization experiments, the actual extent of reaction for each independent reaction was determined. Furthermore, the global reaction heat and adiabatic temperature rise of LPG aromatization reaction system could be estimated. This work would provide a theoretical guidance for the design and scale-up of reactor for LPG aromatization process, as well as for the selection of proper operating conditions.

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