

Modelling of droplet heating and evaporation: recent results and unsolved problems

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Recent results of the investigation of biodiesel and Diesel fuel droplet heating and evaporation, presented in monograph [1] and the most recent original papers [2-6], are summarised. The results of calculations of heating and evaporation of biodiesel fuel droplets, taking into account the contributions of all components, using the discrete components models with finite and infinitely large species diffusivities, and assuming that biodiesel fuel can be treated as a one component fuel, are discussed. It is pointed out that there are serious problems with the application of the discrete components model, based on the analysis of diffusion of individual components, to the modelling of heating and evaporation of realistic Diesel fuel droplets. The generalised multi-dimensional quasi-discrete model and its application to realistic Diesel and gasoline fuel droplets are presented, following [2,4]. New approaches to modelling droplet heating and evaporation, based on kinetic and molecular dynamics models, are briefly summarised following [5,6]. The most important unsolved problems are identified.

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