عنوان مقاله:

Prediction of Crude Oil Pyrolysis Process using Radial Basis Function Networks

محل انتشار:

چهارمین کنفرانس بین المللی نوآوری های اخیر در شیمی و مهندسی شیمی (سال: 1396)

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خلاصه مقاله:

Knowledge of crude oil Pyrolysis and combustion is one of the most important in oil production using in situcombustion method as a section of thermal enhanced oil recovery (EOR) methods. In this method, crude oil undergoesa series of physical and chemical changes that can refer to pyrolysis as a most important part of these changes. In thiswork, we have developed Radial Basis Function networks (RBFN) models to predict remaining weight of crude oilduring crude oil pyrolysis process. API density, viscosity, resin and asphaltene and other components of crude oilcontent, temperature and heating rate are selected as RBFN input parameters, whereas remaining weight of crude oilin different temperatures is considered as network output. The data were obtained by doing thermogravimetric analysisand separation experiments on six samples of various Iranian crude oils. The results of this work show that using aRBFN, we can predict the remaining weight of crude oil during its pyrolysis process with an average absolute relativeerror (ARE) 5.88 percent and mean square error (MSE) 6.15 by newrbe function and an average absolute relative error(ARE) 7.25 percent and mean square error (MSE) 2.51 by newrb function for test data. More over, the results ofregression analysis showed a very good coincidence between the laboratory results and predicted results by theproposed RBFN.

کلمات کلیدی:

Crude oil, EOR, RBFN, Pyrolysis