

Increasing Gasoline Pool of Whole Refinery by using ANN

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A Feed forward and multilayer Perceptron Artificial Neural Network (ANN) with back propagation algorithm was applied for prediction of Research Octane Number (RON) in a live Continuous Catalytic Reforming (CCR) unit. Two years of operating conditions were gathered from DCS. Then all data were evaluated by experienced operators to determine the most effective operating condition. feed final boiling point, coke on catalyst, recycle gas flow rate, reactor inlet temperature, catalyst transfer rate and H_2/HC mole ratio were selected for input of the ANN and the output was set to be RON. A three-layer ANN was adopted to predict RON in terms of aforementioned inputs. To find the best fitted ANN structure, 2484 different structures were examined. The best model was extracted and the obtained data were applied to the live CCR unit with the capacity of 30000 bbl d⁻¹. It was observed that in the optimum operation conditions, the value of the product was 25714 bbl d⁻¹. Applying the ANN data resulted in an increase in the amount of RON amount, from 99 to 99.7, which could be significant in terms of the unit economy. In addition, it was observed that about 640 bbl d⁻¹ of final gasoline was saved in gasoline pool of refinery in this way.

Biography:

Ali Shaeri has a PhD in Process Design Engineering. He is expert in the Refinery's Process Units Simulation, Equipment Design, and Operation. He is teaching related courses at the university as well and working in the National Iranian Oil Engineering & Construction Co. from 13 years. Since then he joined Process Specialty Committee and permanent member of Iranian Petroleum Standard from 2007 to present. He is the first designer of Mini Refinery and pilot plants. He has to his credit more than 10 ISI papers, as well as, 20 publications including papers in referred journals, books and conferences papers.