

عنوان مقاله:

Hydrogen production from natural gas using cold atmospheric plasma and modeling study

محل انتشار:

کنفرانس بین المللی یافته های نوین پژوهشی در شیمی و مهندسی شیمی (سال: 1394)

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خلاصه مقاله:

The production of hydrogen from methane using cold plasma atmosphere were studied. For this purpose, the shining electrical discharge in rotational slider plasma reactor using the AC power supply high voltage and low frequency were used. Parameters CH₄/N₂ molar ratio, voltage (the plasma input power), inlet gas flow rate were studied in this experiment. Molar ratio of 50-50 as the best ratio, also optimum voltage is 2kV and appropriate feed flow rate is 500 ml/min. Methane conversion: 71.19%, selectivity of hydrogen: 80.35% and yield of hydrogen: 57.20% were obtained. Performance of the dry reforming of methane at atmospheric pressure has been simulated by a set of supervised Artificial Neural Network (ANN) models using reaction data gathered in a microreactor device. The good agreement between predicted and observed values demonstrates the power and reliability of the ANN model and Hybrid Genetic Algorithm for optimization of the reaction conditions.

کلمات کلیدی:

(Reforming. Cold atmospheric plasma. Selectivity. Artificial Neural Network (ANN)

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