Abstracts of Papers in English

MODELING THE GROWTH KINETIC OF YEAST BBRC-9026 ON PHENOL

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Key Words: kinetics model, haldone's equation, Inhibition, pheneo, activated sludge system.

Abstract

m=0.592 (1/h), Ks= 920.3 (mg/L), and KI= 115.62 (mg/L). This kinetic model is a good tool for simulation and scale-up in designing an industrial wastewater bio-treatment processδIn this study, phenol-degrading microorganisms were isolated from an activated sludge system that had been acclimated with synthetic phenolic wastewater for six months. After investigating the performance of each strain on phenol, in the presence and absence of co-substrate, the best-isolated strain was chosen. In the next phase, the best-isolated microorganism's growth on different phenol concentrations was examined in a shaking flask scale, at different times. The kinetic constants obtained by modeling the growth kinetic of the best isolated strain, according to the Haldane model, and with the help of Matlab 6.5, were.

STUDY OF ORGANIC POLLUTANTS IN TEHRAN GROUND WATER

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Key Words: groundwater, Tehran, organic pollution, nitrate pollution, petroleum pollution and wastewater disposal system.

Abstract

In this study, the Total Organic Carbon, Nitrate and Petroleum hydrocarbons of Tehran's groundwater have been measured. According to this study, the average TOC was 9.3 mg/L, which is much above standard. For the Nitrate, although there were few samples below standard, samples above 45 mg/L were numerous, with a maximum of 133 mg/L. The Petroleum Hydrocarbon content of most of the wells was negligible, nev-

ertheless there were two wells indicating MTBE content, which shows contamination from the underground tanks of nearby gas stations. In conclusion, Tehran groundwater needs special treatment to be used as a drinking water.

OPTIMIZATION OF OXIDATIVE COUPLING OF METHANE OVER PEROVSKITE CATALYST AND OCM KINETICS MODELING BY GENETIC ALGORITH

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Key Words: genetic algorithm, OCM kinetic, perovskite.

Abstract

Gas phase kinetic studies on the oxidative coupling of methane, OCM, have been conducted in a tubular fixed bed reactor, using perovskite titanate as the reaction catalyst. The suitable operating conditions were found to be: temperature between 750-775$^{\circ}C$, CH_4/O_2 ratio of 2 and GHSV of 100 min^{-1}.

Six models have been selected among the overall common kinetic models. The selected models have been regressed with the experimental data.

The kinetic coefficients were optimized by different numerical optimization methods such as: the Levenburg-Marquardt and genetic algorithms and the results were compared with each other.

It has been found that the Santamaria model is in good agreement with the experimental data.

It should be noted that in the Marquardt algorithm there is possibility to trap in the relative minimum.

MMP DETERMINATION BY PARACHOR METHOD AND COMPARISON WITH ANALYTICAL METHOD

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Key Words: EOR, miscible injection , MMP Displacement, EOS, parachor model.

Abstract

The minimum miscibility pressure (MMP) is a key concept in EOR by using miscible gas injection. In this report, MMP will be calculated by analytical and Parachor methods and the results are compared with experimental data. In the analytical method, initial and injection tie lines are determined by using negative flash calculations for both reservoir oil and injection gas. These tie lines will be corresponded with cross tie lines. MMP is the pressure where the length of one tie line (from initial to injection tie lines) equals zero. In the second method, MMP is calculated according to this fact; that interfacial tension between two phases goes to zero at completely miscibility. The interfacial tension is calculated by the Parachor model. Analytical calculations are performed by PR, SRK and MNM EOS. Results of analytical and Parachor methods are compared with the experimental data of slim tube and vanishing interfacial tension (VIT) methods. Results show superior agreement between calculations and experimental data. Our results indicate that MMP will be reduced significantly, due to the presence of intermediate components of reservoir oil in the injection gas and the similarity between reservoir oil and injection gas.

VOLUME FLOW RATE AND BED DEPTH EFFECTS OF CARBON ACTIVE RESIN IN BENZOIC ACID ADSORPTION

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Key Words: adsorption, activated carbon, benzoic acid, volumetric flowrate, bed depth of resin.

Abstract

The recovery of benzoic acid, as an intermediate and additive component in chemical industries, is a convectional process. Also, benzoic acid is usually removed as a pollutant from wastewater streams and is treated with a fixed-bed, via physical adsorption processes, onto granular activated carbon. In this research work, wastewater is passed onto active carbon in a chromatographic glass tube and the related heat of adsorption is measured by a calorimeter. The results show that this adsorption is physical, because the amount of heat of adsorption is less than the minimum chemical adsorption. In ad-

dition, in the present research work, the bed depth effect of resin and the feed volumetric flow rate have been studied at laboratory scale to determine optimum conditions. Finally, based on experiments and their results, the optimum conditions are determined at a 6 cm bed depth with a granular carbon active resin 30-36 mesh, 0.75 ml/min volume flow rate and a chromatographic glass tube with an inner diameter of 9.5 mm.

UNSTEADY SOLUTION OF THE LINEAR AND NONLINEAR PRESSURE EQUATION IN SINGLE-PHASE OIL RESERVOIRS, USING THE GREEN ELEMENT METHOD

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Key Words: oil reservoir simulation, green element method, finite element method, boundary dlement method.

Abstract

In this study, numerical solutions to one dimensional transient linear and nonlinear oil flow in both homogeneous and heterogeneous media are achieved, based on the newly developed Green Element Method (GEM). GEM is a new numerical method based on a singular theory of the boundary element method. However, utilizing the discretization feature of finite element method leads to forming a sparse and banded global matrix, which is easier to solve. Solution procedure in this method commences by formation of free space Green function and conversion of original partial differential equation to integral equation. Then the resulted integral equation is discretized in domain and time space to form elemental equation. Finally, Solution will end through assembling of elemental equation and implementation of boundary conditions. By applying GEM, some examples of linear and nonlinear flow were solved and the results were compared with the available analytical solution. The comparison shows good agreement between them.

KINETICS MODEL OF ULTRA DEEP HDS REACTION FOR GAS OIL FRACTION

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Key Words: hydrotreating, kinetic, catalyst, dibenzothiophene, petroleum cuts.

Abstract

Hydrodesulfurization (HDS) technology is one of the most important and new goals of researchers in the petroleum refining industry for reduction of the sulfur content of gasoil to the lower limits. In this research, a systematic investigation was carried out to determine the kinetics of the HDS reaction for dibenzothiophene in gasoil. Experiments were carried out in a micro trickle bed reactor in a temperature range of 360-380°C , a pressure range of 55-70 bars and the LHSV of 0.5- 2h^{-1}. A power law model was considered for determination of the kinetic parameters of the HDS reaction, and the reaction rate order and activation energy of this model were calculated. The results revealed that the order of reaction is 1.4 and the activation energy was estimated to be 15 kcal/mol