Уважаемые коллеги

Приглашаем вас на семинар «Development of a petro-informatics platform for the characterization of heavy petroleum fractions», докладчик профессор Ryuzo Tanaka, Technology & Engineering Center, Idemitsu Kosan Co., Ltd. Семинар состоится 12-го февраля в 16:00 в актовом зале Центра морского бурения РГУ Нефти и Газа (НИУ) имени И.М. Губкина (3-й этаж 1-го корпуса, блок аудиторий 323).

Доклад посвящен разработанной информационной системе «Petro-Informatics Platform: PIP», основу которой составляют три фундаментальные технологические дисциплины: Петролемика (подробный анализ состава и структуры, метод масс-спектрометрии высокого разрешения FT-ICR-MS), Молекулярное моделирование и Нефтеинформатика. Также в докладе будет обсуждаться разработанная модель агрегации асфальтенов «Multi-components Aggregation Model: MCAM».

Для заказа пропусков в Губкинский университет, пришлите, пожалуйста, заявку в произвольной форме с ФИО и местом работы на почту Vladimir.kuryakov@gmail.com (+7-926-285-45-84 Владимир Курьяков), в теме письма укажите «Семинар Танака в Губкинском»

Abstract of professor Tanaka talk:

An informatics system was developed to obtain the chemical structure, physical properties, and reactivity of petroleum molecules, and also to evaluate their usefulness in the oil industry. The system, called the “petro-informatics platform: PIP,” integrated three fundamental technological disciplines of petroleomics, namely, detailed composition and structure analysis, molecule-based kinetic modeling, and petro-informatics.

An analytical technique that used FT-ICR-MS (Fourier transformation ion cyclotron resonance mass spectrometry) was developed to clarify the composition of heavy petroleum fractions in detail. The identification of the chemical structures of molecules in the fractions was performed deterministically with a newly developed data analysis program. Based on the chemical information, a molecule-based kinetic model of RDS (residuum desulfurization) was constructed using the JKMT (kinetic modeler’s toolbox for JPEC) modeling tool. An attribute-based reaction modeling technique (ARM) was utilized to reduce the model size of the complex reaction system. Rate parameters in the model were derived from the data of a series of high-throughput experiments. The reaction experiments, analytical data, and model input and output, were all handled and analyzed through the PIP.

Additionally, an asphaltene aggregation model called the “multi-components aggregation model: MCAM,” was also developed. The developed model could predict the quantities of solution, aggregation, and solid phases. The averaged aggregation degree of the aggregation phase in a heavy oil molecular system could also be predicted based on the structure and properties of all the molecules in the system. The model is applicable to various problems encountered by the oil industry from upstream or downstream, such as asphaltene precipitation in a wellbore, the presence of storage tank sludge, and the sediment present in a heat exchanger. The molecule-based aggregation model would make a powerful tool that could predict and analyze the above mentioned asphaltene related problems.