

Dear readers,

the traditional 43rd symposium "Fuels 2010" organized by the *Croatian society for fuels and lubricants* was held in October. Based on lectures and meetings with the participants I would like to sum up the standpoints and the guidelines in some areas of the production and the application of fuels. First of all, I have to emphasize the scientific paper on the first phase of modernization of the Rijeka Oil Refinery which we have been waiting for a long time. Designing and starting new refinery chemical plants actually mean the implementation of new technologies and knowledge as well as keeping the strategic significance of this industry for Croatia. Therefore, so it is in everyone's best interest: the manufacturer keeps the old and gets some new costumers by the improved product quality, the users get the product responding to the requirements; there is an improved control of the influence on the environment and the additional need for highly educated experts of different professions. We congratulate our colleagues on their achievements and wish them to continue their work with constant innovations in the area of technological and economical excellence. The importance of this process can not be emphasized enough in the time when the number of refineries in the developed market is reduced and for other refineries there is a constant need for investments and strategic guidance also towards other products, apart from fuel, the production of petrochemicals, polymers, thermal and electrical energy. The resultant of current circumstances, the stagnation and a slow increase in the transport section (in the region), increased power of internal combustion engines (with reduced fuel consumption), and the expected increase of mixed drive portion and exclusively electric vehicles, especially for city driving, require exquisite local market forecasting, including legal directives, and systematic decision making at the right time from the company management.

Today the most of conversion refinery processes are catalytic. This means that the development of catalysts will greatly influence the development of accompanying processes. This symposium topic was discussed on several occasions. The development of catalyst is usually evaluated from the point of activity, selectivity and stability, having in mind that all these features are interrelated. The catalyst activity increase is achieved by new and improved chemical formulations and also by active surface increase which is the area of nanotechnology. Still, the dispersion of active substances at the nano level usually results in reduced catalyst stability and increased poisoning possibility. The improvements of catalyst support, usually inorganic, can be extremely significant. Changing the chemical and phase system of oxides can result in considerably better mechanical catalyst stability. The area of their application is spread towards wider molecule range by the zeolite synthesis with mezzo (medium) size of the pores. In this way an important progress has been made since the distribution of pore size can be adjusted to an original raw material in the certain process which improves the selectivity and conversion of the reaction. Therefore, a catalyst is designed according to the requirements of particular process

and according to the properties of the original raw material. Also, it is expected that the development of catalysts will be directed towards their multifunctionality. Additives are another significant factor in the fuel industry and they can, even in small amounts, change the application properties of a product. Their importance is additionally pointed out in mixtures of mineral fuels and bio-fuels, with direct influence on the profitability, but they also reflect in the reputation of a particular company throughout their premium product segment (it is not all about the brand, but the word spread among the customers). The key is the identifying the mechanisms of action of certain additives, a single one and in the blend, and the thermodynamic molecule interaction, the influence of miscibility and fuel homogeneity (which also involves the quality of combustion, viscosity, vapour pressure and other properties). Mixtures of mineral fuels and bio-fuels necessarily affect the analytical problem, dealt by the analytical section which was very active this year. Apart from considering the possibilities of the existing standard methods applied for petroleum and its derivatives (hydrocarbon base) on their mixtures with bio-fuels, other possibilities of determining greater number of the essential physical and chemical properties of fuel by the use of vibrational spectroscopy and mathematical regression tools, in a short period of a few minutes and a few milliliters of a sample. The area of analytics, apart from evaluating the product, also spreads into processing plants where particular values are monitored in the real time. Together with instrument techniques, wide possibilities of using software sensors were emphasized.

I do not intend to write a full paper out of this introduction so other topics will be discussed in the following issues. In this issue one of introductory symposium papers on modern refinery processes is presented.

I hope that you will find these topics to be interesting enough for you to participate and contribute in the regular symposium discussions of the Society.

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