68d Science and Technology of Deep Desulphiding of Oil Refinery Streams

Jacob A. Moulijn, Michiel Makkee, Daniel van Herk, Joana Tsou, Nathalie Marquez, and Michiel T Kreutzer

Oil refinery related catalysis, in particular hydrodesulphurization, is generally viewed as mature technology without much chances for breakthroughs. This might lead to the conclusion that research in this area is of low priority. Is this true? Is oil-related catalysis a mature technology?

In fact in the field of catalysis in the oil refinery a lot of new ideas have been put forward in the open literature and in patents. The need for deep desulphurization obviously has been a great inspiration for chemists and chemical engineers. Highly original ideas have been put forward both with respect to new catalysts and new processes.

Perspectives of different desulphurization technologies will be evaluated. The progress achieved during recent years in catalysis-based HDS (new catalysts, advanced reactor design, multifunctional reaction systems) and ‘non-HDS' processes for sulphur removal (alkylation, extraction, precipitation, oxidation, adsorption) will be illustrated.

It will be concluded that desulfurization is not mature in the sense that there is no opportunity anymore for new ideas. An integrated approach (catalyst selection and development, reactor design, process configuration) can lead to novel, efficient processes for zero-sulphur fuels. It also makes sense to get a detailed understanding of the mechanisms and kinetics in optimising existing and developing new processes and catalysts.