

AvaNews Update 2/2008

Application Focus: Petrochemical Analysis

The following summary and attached paper detail the research of Yijiao Jiang and Michael Hunger at the University of Stuttgart, Germany. The UV/VIS measurements in this research were taken with Avantes' AvaSpec 2048 spectrometer, AVALIGHT DH-S deuterium halogen light source and FCR-7UV200-3-SR-S1 reflection probe.

Introduction

The process of converting methanol to olefins on solid acid catalysts was developed as a route to produce light olefins from natural gas [1]. During the last decades, increasing efforts were made to clarify the mechanism of the methanol-to-olefin (MTO) conversion on acidic zeolite catalysts under industrial conditions by modern NMR spectroscopic techniques [2, 3]....To gain more insight into the formation of organic deposits on MTO catalysts, the novel in situ MAS NMR-UV/Vis technique [4] combined with on-line gas chromatography was applied in the present work.

Conclusion

While solid-state NMR spectroscopy allows quantitative studies of the C carbon atoms in different chemical environments, such as alkyl groups and aromatic rings, UV/Vis spectroscopy is sensitive for different aromatic compounds, such as polyalkylaromatics and polycyclic aromatics. The most important coke deposits observed by UV/Vis spectroscopy are polycyclic aromatics with chain-like topology, such as polymethylantracenes. The detailed position and shape of the UV/Vis bands of these compounds were found to depend on the amount of coke deposits.

See complete article attached to this newsletter as a .pdf file

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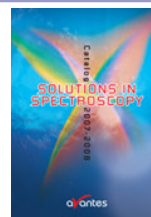
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