Preface

Supported metal oxide catalysts are currently extensively employed in the chemical, petroleum and pollution control industries. Supported metal oxide catalysts consist of an active metal oxide component (e.g., oxides of V, Mo, Cr, W, Re, etc.) deposited on the surface of an oxide support (e.g., Al₂O₃, SiO₂, TiO₂, etc.). In certain applications, the supported metal oxide catalysts are also combined with noble metals in order to enhance the catalytic properties of the noble metal component (e.g., Pt/CeO₂/Al₂O₃ and Pt/SnO₂/Al₂O₃). Some of the more important applications of supported metal oxide catalysts are: dehydrogenation of n-butane to butene over CrO₃/Al₂O₃, ethylene polymerization over CrO₃/SiO₂, hydrodesulfurization (HDS) of crude oil over MoO₃/Al₂O₃ and WO₃/Al₂O₃, oxidation of o-xylene to phthalic anhydride by V₂O₅/TiO₂, epoxidation of propylene by hydrogen peroxide over TiO₂/SiO₂, olefin metathesis over Re₂O₇/Al₂O₃, selective catalytic reduction (SCR) of NOₓ emissions with V₂O₅/WO₃/MoO₃/TiO₂, ammonoxidation of alkyl aromatics by V₂O₅/Al₂O₃ and V₂O₅/TiO₂, oxidation of H₂S to elemental sulfur over Fe₂O₃/Al₂O₃ and Fe₂O₅/SiO₂, oxidation of chlorinated volatile organic compounds with CuO/ CrO₃/Al₂O₃, oxidation of dioxin and PCB emissions by V₂O₅/TiO₂, N₂O decomposition to N₂ and O₂ over NiO/ZrO₂, and n-butane isomerization to isobutane over SO₄/ZrO₂ and WO₃/ZrO₂ catalysts.

In spite of the growing importance of supported metal oxide catalysts, there have been very few review articles on this subject. Thus, it was decided by Julian Ross and myself that it would be a timely topic to devote a special issue of Catalysis Today. However, it was not possible to find authors for all applications of supported metal oxide catalysts in the time frame of the publication of this issue and, consequently, only about half of the current applications are covered in this special issue. Hopefully, a second issue of Catalysis Today will be devoted to the additional “applications of supported metal oxide catalysts” in the near future.

I first want to thank all the authors who have so enthusiastically agreed to write the excellent review papers for this special issue of Catalysis Today and who have made this issue possible. Secondly, I would like to thank the various scientists who have agreed to anonymously review the detailed manuscripts. I especially want to acknowledge Professor Michael Amiridis (Department of Chemical Engineering at the University of South Carolina) for assisting with the review process of the two manuscripts from Lehigh University and Mrs. Marge Sawyers (Zettlemoyer Center for Surface Studies, Lehigh University) for efficiently coordinating the review process.

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