

Preface

Plasma technology has been used traditionally for synthesis of NO, NH₃ and hydrocarbons. Recently, research activity in the area of plasma-assisted catalysis has increased greatly for applications such as emission control. Plasma techniques are heavily utilized in the semiconductor industry and coating applications to modify surface properties. Recently, an increasing number of publications have been devoted to plasma-based technology for catalyst preparation, modification and catalytic conversions. The value of plasma techniques for the preparation and regeneration of catalysts and various heterogeneous catalytic reactions has been recognized.

This issue of *Catalysis Today* is based on a symposium sponsored by the American Chemical Society and the Petroleum Research Fund that took place at the ACS National Meeting in August 2000 in Washington, DC. This symposium was organized to gather the experts in both plasma and catalysis fields to share knowledge and experience and to improve the understanding of the value of the plasma techniques in catalysis. This special issue focuses on the applications of plasma techniques in various catalysis areas including catalyst preparation, catalyst modification and catalytic reactions. Contributions are grouped into three application sections: (a) catalyst preparation and properties, (b) methane activation, and (c) pollution control.

The first contribution, "Catalyst Preparation using Plasma Technologies", provides a short review of various thermal and non-thermal plasma techniques for catalyst synthesis and modification. It sets the tone for the following four contributions dealing with different chemical and physical properties of catalytic materials prepared by the plasma techniques.

Two contributions investigate the benefits of plasma techniques to activate methane. This represents an

additional approach to traditional catalysis to utilize this abundant gaseous fuel/chemical source. Five more contributions show the advantages of plasma techniques to tackle the pollution problems including air and wastewater emissions. It appears that additional environmental problems, such as global climate change, will benefit from creative applications of more plasma techniques in the near future.

We would like to express our appreciation to the authors of this special issue for their patience during the review process. We owe special thanks to all the willing reviewers who undertook the challenging task of reviewing the creative research in this new area. We trust the issue of *Catalysis Today* will help stimulate more investigations in the area and we hope this issue stimulates ideas leading to break-through technologies.

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