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Catalytic Conversion for Clean Energy: From Basics to Applications

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The unrestrained combustion of fossil fuels is the leading contributor to greenhouse gas (GHG) emissions, which are the primary driver of global climate change and environment crisis. To achieve CO₂ emissions reaching net zero between 2050 and 2060, i.e., carbon neutrality, it is highly necessary to make a rapid shift to clean and sustainable energy sources. Within this context, heterogeneous catalysis plays a central scientific role, offering a platform to help the existing energy systems to reduce GHG emissions and create innovative pathways for clean energy generation.

Within this special issue—Catalytic Conversion for Clean Energy: From Basics to Applications, the most recent research advances in surface science, sustainable energy and environmental catalysis have been compiled and systematically reviewed. This special issue includes 12 original research articles and 6 review articles. The selected articles are organized into the following topics: model catalysis

(articles 1–2), hydrogen energy (articles 3–5), exhaust gas treatment (articles 6–8), value-added chemical conversion (articles 9–12), electrochemical ammonia synthesis (articles 13 and 14), and volatile organic compounds control (articles 15–18).

The guest Editors are grateful to the Editors-in-Chief, Prof. Hans-Joachim Freund and Prof. Eric I. Altman, and the Managing Editor, Dr. Cansu Kaya, for their guidance leading to the accomplishment of this Special Issue. As guest editors we wish to express our appreciation to all contributing authors and reviewers who have made this special issue possible. We anticipate that readers will find these articles helpful, as they offer insights into the latest technological advancements in catalysis.

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