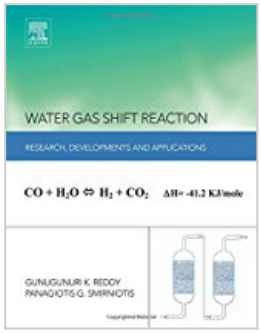

Water Gas Shift Reaction: Research Developments and Applications

By Panagiotis Smirniotis, Krishna Gunugunuri

Water Gas Shift Reaction: Research Developments and Applications By Panagiotis Smirniotis, Krishna Gunugunuri

Water Gas Shift Reaction: Research Developments and Applications outlines the importance of hydrogen as a future fuel, along with the various hydrogen production methods. The book explains the development of catalysts for Water Gas Shift (WGS) reaction at different temperatures and steam/CO ratios, and also discussing the effect of different dopants on the WGS activity of iron oxide and the promotion and inhibition roles of the dopants on the WGS activity of iron oxide are explained.

In addition, the book describes extensive characterization of modified ferrite catalysts, especially with Mossbauer spectroscopy and its advantage in understanding properties of metal doped ferrite catalysts, the exact dopant location, and its effect on electron hopping capability and WGS activity of Fe redox couple.

- Outlines the importance of the Water Gas Shift Reaction and its application for hydrogen production
- Provides detailed information on potential catalysts, their development, and their pros and cons, giving the reader insights on how modified ferrite catalysts work at different temperatures and different steam to CO ratios
- Reviews hydrogen technology, its current importance, and production methods
- Presents a clear presentation of the topics with many graphics and tables
- Offers basic and advanced knowledge of catalysts characterization instrumental techniques

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Editorial Review

From the Back Cover

The *Water Gas Shift Reaction* publication outlines the importance of hydrogen as a future fuel and the various hydrogen production methods. This book explains the development of catalysts for Water Gas Shift (WGS) reaction at different temperatures and different steam/CO ratios. It also explains the effect of different dopants on the WGS activity of iron oxide and the promotion and inhibition roles of the dopants on the WGS activity of iron oxide are explained. It also describes extensive characterization of modified ferrite catalysts especially with Mossbauer spectroscopy and its advantage in understanding properties of metal doped ferrite catalysts, the exact dopant location and its effect on electron hopping capability and WGS activity of Fe^{3+}/Fe^{2+} redox couple.

- Outlines the importance of the Water Gas Shift Reaction and its application for hydrogen production
- Provides detailed information on potential catalysts, their development and their pros and cons (eg The reader will gain insight about how modified ferrite catalysts work at different temperatures and different steam to CO ratios and the negative and positive effect of dopants
- Reviews the hydrogen technology, its current importance and production methodsClear presentation with many graphics and tables
- Offers basic and advanced knowledge of catalysts characterization instrumental techniques

About the Author
Prof. Smirniotis's has more than 22 years of experience in catalysis. His research at UC is characterized by in-depth investigations to advance the fundamental understanding and practical aspects of numerous catalytic systems of major Industrial, Environmental and Energy related processes. His research is highly recognized for its breadth, excellence, and unique thoroughness resulting in an H Index equal to 34. Currently, he has more than refereed 130 publications in international journals (Appendix 1).

Prof. Smirniotis group has been developing modified ferrite catalysts for the high temperature water gas shift (WGS) reaction for the last 7 years. We have published 12 papers in this area in highly prestigious journals like Journal of Catalysis, Journal of Physical Chemistry C, Journal of Membrane Science, and Applied Catalysis A: General etc. Our group is the first one to develop modified ferrite catalysts for ultra high temperature membrane reactor WGS applications. Our group is the first one to explain the negative effect of Cu observed in the water gas shift reaction. We explained this negative effect of Cu by using several techniques.

So far, there are several books available for development of shift catalysts. However, in recent years researchers from around the globe made so many variations and approaches to conduct high temperature WGS reaction like membrane reactors, homogeneous WGS reaction, non-ferrite catalysts. We want to publish all these novel findings and carry comparisons with the existing literature in the form of a book.

Dr. Krishna Gunugunuri was born in 1982 at Hyderabad, India. After his Master's degree in Chemistry at Osmania University, he moved to Indian Institute of Chemical Technology, Hyderabad, to pursue his Ph.D. degree under the guidance of Dr. B.M. Reddy. He worked at Environmental and Catalytic Research Institute, Lyon, France, as a visiting fellow under Indo-French collaboration project with Dr. Stephane Loridant. He is currently working as a post doctoral fellow at School of Energy, Environmental, Biological and Medical

Engineering, University of Cincinnati. His research interests are developing catalysts for refining & energy related industries, Fine chemicals synthesis using metal & metal oxide catalysts, Developing solid acids & bases for organic transformations, Adsorption of CO2, flue gas components using metal oxide sorbents, Separation of bio-related molecules with mesoporous sorbents. He has 34 research publications in high quality international journals and his papers have been cited more than 300 times (h-index 10).

Users Review

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Kelli Ross:

This Water Gas Shift Reaction: Research Developments and Applications book is not really ordinary book, you have it then the world is in your hands. The benefit you have by reading this book will be information inside this book incredible fresh, you will get data which is getting deeper anyone read a lot of information you will get. This particular Water Gas Shift Reaction: Research Developments and Applications without we realize teach the one who studying it become critical in contemplating and analyzing. Don't always be worry Water Gas Shift Reaction: Research Developments and Applications can bring when you are and not make your handbag space or bookshelves' come to be full because you can have it within your lovely laptop even phone. This Water Gas Shift Reaction: Research Developments and Applications having good arrangement in word along with layout, so you will not sense uninterested in reading.

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