



Graphical Abstracts/Chin Chem Lett 29 (2018) iii–xviii

Special Column: Surface chemistry connecting heterogeneous catalysis, photocatalysis and plasmonic catalysis

Editorial

Surface chemistry connecting heterogeneous catalysis, photocatalysis and plasmonic catalysis

Chinese Chemical Letters 29 (2018) 725

Weixin Huang^a, Zili Wu^b, Junwang Tang^c, Wei David Wei^d, Xuefeng Guo^e^a Hefei National Laboratory for Physical Sciences at the Microscale, CAS Key Laboratory of Materials for Energy Conversion and Department of Chemical Physics, University of Science and Technology of China, China^b Chemical Science Division and Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, United States^c Department of Chemical Engineering, University College London, United Kingdom^d Department of Chemistry, University of Florida, United States^e College of Chemistry and Chemical Engineering, Nanjing University, China

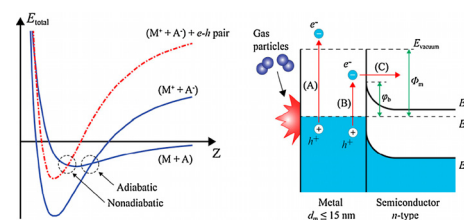
Reviews

Hot electron generation on metal catalysts under surface reaction: Principles, devices, and application

Chinese Chemical Letters 29 (2018) 727

Ievgen I. Nedrygailov^a, Hyosun Lee^a, Si Woo Lee^{a,b}, Jeong Young Park^{a,b}^a Center for Nanomaterials and Chemical Reactions, Institute for Basic Science, Daejeon 305-701, Republic of Korea^b Graduate School of EEWS, Korea Advanced Institute of Science and Technology (KAIST), Daejeon 305-701, Republic of Korea

Transfer of charge through metal-support interfaces leads to an increase in the activity of mixed catalysts. In this review, we consider the main aspects of research aimed at studying processes that create and allow interphase transfer of highly excited (hot) charge carriers in supported catalysts, and discuss the effect of these phenomena on catalytic activity.

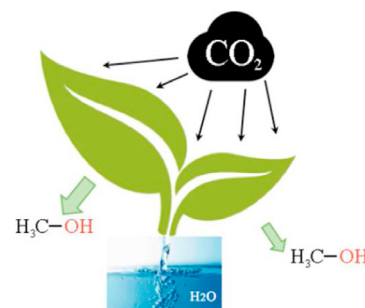


Photocatalytic carbon dioxide reduction by photocatalyst innovation

Chinese Chemical Letters 29 (2018) 734

Angie Davina Tjandra^a, Jun Huang^b^a School of Chemical and Biomolecular Engineering, The University of Sydney, New South Wales 2006, Australia^b Laboratory for Catalysis Engineering, School of Chemical and Biomolecular Engineering, The University of Sydney, New South Wales 2006, Australia

The photocatalytic conversion of carbon dioxide into sustainable fuel methanol using carbon quantum dots is highlighted in this paper. The multifaceted roles of carbon quantum dots in photocatalytic reactions and future directions of CQD materials are outlined.



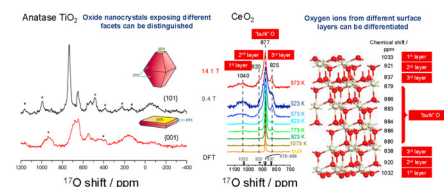
Recent progress in investigations of surface structure and properties of solid oxide materials with nuclear magnetic resonance spectroscopy

Jia-Huan Du, Luming Peng

Key Laboratory of Mesoscopic Chemistry of Ministry of Education, School of Chemistry and Chemical Engineering, Nanjing University, Nanjing 210023, China

In this review, some of the latest research developments on the characterization of the structure and properties of oxide materials by applying solid-state nuclear magnetic resonance spectroscopy (NMR), including the use of dynamic nuclear polarization (DNP) NMR, ^{17}O NMR combined with surface selective labeling and ^{31}P NMR coupled with phosphorous-containing probe molecules, are discussed.

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Communications

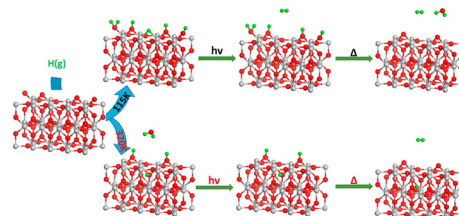
Thermal-, photo- and electron-induced reactivity of hydrogen species on rutile $\text{TiO}_2(110)$ surface: Role of oxygen vacancy

Zongfang Wu, Feng Xiong, Zhengming Wang, Weixin Huang

Hefei National Laboratory for Physical Sciences at the Microscale, CAS Key Laboratory of Materials for Energy Conversion and Department of Chemical Physics, University of Science and Technology of China, Hefei 230026, China

The formation and reactivity of various types of hydrogen species on rutile $\text{TiO}_2(110)$, including surface hydroxyl group, surface hydride species and bulk hydrogen species sensitively depend on the oxygen vacancy concentration and structure.

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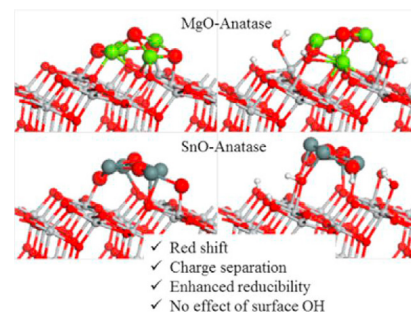
Impact of surface hydroxylation in MgO-/SnO-nanocluster modified TiO_2 anatase (101) composites on visible light absorption, charge separation and reducibility

Stephen Rhatigan, Michael Nolan

Tyndall National Institute, University College Cork, Lee Maltings, Cork T12 R5CP, Ireland

Anatase TiO_2 surfaces, whether oxidised or hydroxylated, can be modified by nanoclusters of SnO and MgO to give a red shift in light absorption, enhanced charge separation and high reducibility.

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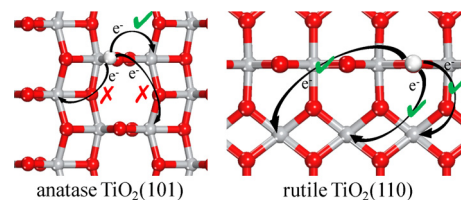
Unique adsorption behaviors of NO and O_2 at hydrogenated anatase $\text{TiO}_2(101)$

Fei Li, Wen-Hao Huang, Xue-Qing Gong

Key Laboratory for Advanced Materials, Centre for Computational Chemistry and Research Institute of Industrial Catalysis, School of Chemistry and Molecular Engineering, East China University of Science and Technology, Shanghai 200237, China

The extra electron on the hydrogenated anatase $\text{TiO}_2(101)$ is localized at the nearest Ti_{sc} only, and the charge-transfer promoted NO and O_2 adsorptions are also site-selective. These results are totally different from those at hydrogenated rutile $\text{TiO}_2(110)$.

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