

## Dehydrogenation By Heterogeneous Catalysts

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### Dehydrogenation By Heterogeneous Catalysts

The dehydrogenation of lower alkanes is typically carried out on two different types of catalysts: a) Pt-based catalysts and b) chromia-based catalysts.4-6The main characteristics of these two types of catalysts will be discussed here, together with some reference to other less common materials.

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Heterogeneous catalytic routes Styrene. Dehydrogenation processes are used extensively to produce aromatics in the petrochemical industry. Such processes are highly endothermic and require temperatures of 500 °C and above. Dehydrogenation also converts saturated fats to unsaturated fats.

### Dehydrogenation - Wikipedia

Efficient and selective dehydrogenation of formic acid is a key challenge for a fuel-cell-based hydrogen economy. Though the development of heterogeneous catalysts has received much progress, their catalytic activity remains insufficient. Moreover, the design principle of such catalysts are still unclear. Here, experimental and theoretical studies on a series of mono-/bi-metallic nanoparticles supported on a NH<sub>2</sub>-N-RGO substrate are combined for formic acid dehydrogenation where ...

### A Simple and Effective Principle for a Rational Design of ...

Heterogeneous catalytic routes Styrene. Dehydrogenation processes are used extensively to produce aromatics in the petrochemical industry. Such... Other alkenes. The importance of catalytic dehydrogenation of paraffin hydrocarbons to olefins has been growing steadily... Formaldehyde. Formaldehyde is ...

### Dehydrogenation - WikiMili, The Best Wikipedia Reader

All Cu and Ru catalysts occurred to be active towards alcohol dehydrogenation, and concomitant production of gaseous H<sub>2</sub> was registered, proving the adopted acceptor-less mechanism. The most active Cu catalyst was Cu/ZrO<sub>2</sub> (amphoteric support), for which the conversion of alcohol was complete after 24 h. It was followed in activity by Cu/C (neutral carrier), and Cu/ZnO (basic support).

### Activity of heterogeneous supported Cu and Ru catalysts in ...

In this critical review, we provide the current investigations on the heterogeneous catalysts (such as Pt, CrO<sub>x</sub>, VO<sub>x</sub>, GaO<sub>x</sub>-based catalysts, and nanocarbons) used in the direct dehydrogenation of propane to propylene. A detailed comparison and discussion of the active sites, catalytic mechanisms, influencing factors (such as the structures, dispersions, and reducibilities of the catalysts and promoters), and supports for different types of catalysts is presented.

### State-of-the-art catalysts for direct dehydrogenation of ...

These findings provide a promising route to prepare efficient Pt-based bimetal dehydrogenation catalysts by isolating Pt atoms into single-site catalysts via assembling atomically ordered IMAs. We also expect that the reported discovery will open the exploitation of single-site IMAs as robust active sites for the catalytic dehydrogenation ...

### Propane Dehydrogenation on Single-Site [PtZn<sub>4</sub> ...

dehydrogenation with single-site heterogeneous catalysts. These results also show some preference for Co<sub>2</sub>+ active sites to associate with SiO<sub>2</sub>-Zr-O- sites over SiO<sub>2</sub>-. 1. INTRODUCTION On-purpose production of propylene via nonoxidative propane dehydrogenation1 (PDH) from conventional and shale gas

### Zirconium Modification Promotes Catalytic Activity of a ...

The first comprehensive survey of the principles and applications of heterogeneous catalysis! Starting with the invention of Döbereiner's tinder box and reaching importance with Haber's development of ammonia synthesis, heterogeneous catalysis has become a multi-billion dollar business.

### Handbook of Heterogeneous Catalysis | Wiley Online Books

Nickel-based nanocatalysts were used in acceptorless, reversible dehydrogenation and hydrogenation reactions of N-heterocycles. Both processes were realized in the same solvent using a single catalyst, without isolation of products and workup, which makes it attractive for hydrogen storage purposes.

### Heterogeneous nickel-catalysed reversible, acceptorless ...

Styrene Catalysts. BASF StyroStar ® styrene catalysts are used in a wide range of 2 and 3 reactor adiabatic dehydrogenation technology designs. These technologies combine superheated steam with ethyl benzene to produce styrene with minimum formation of by-products.

### Oxidation & Dehydrogenation Catalysts | BASF Catalysts

Activity of heterogeneous supported Cu and Ru catalysts in acceptor-less alcohol dehydrogenation. Abstract Acceptor-less alcohol dehydrogenation reaction allows the co-production of added-value carbonyl compounds and H<sub>2</sub> from alcohols. Focusing on supported Ru and Cu catalysts, we evaluated the support effect on the dehydrogenation of 2-octanol and 1-octanol and identified the side products as resulting from aldolisation coupling.

### Activity of heterogeneous supported Cu and Ru catalysts in ...

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### Heterogeneous catalysts | Johnson Matthey

As a result, heterogeneous catalysts account for about 80% of all the catalytic processes currently used in industry. Despite their widespread use, heterogeneous catalysts are intrinsically plagued by surface heterogeneity and structural complexity, two factors that make it extremely difficult to decipher the catalytic mechanisms.

### Introduction: Heterogeneous Single-Atom Catalysis ...

Progress in heterogeneous catalysis is often hampered by the difficulties of constructing active architectures and understanding reaction mechanisms at the molecular level due to the structural complexity of practical catalysts, in particular for multicomponent catalysts. Although surface science experiments and theoretical simulations help understand the detailed reaction mechanisms over ...

### Subsurface catalysis-mediated selectivity of ...

Heterogeneous catalysts. Heterogeneous catalysts for hydrogenation are more common industrially. In industry, precious metal hydrogenation catalysts are deposited from solution as a fine powder on the support, which is a cheap, bulky, porous, usually granular material, such as activated carbon, alumina, calcium carbonate or barium sulfate.

### Hydrogenation - Wikipedia

heterogeneous catalysts for the oxidative dehydrogenation of alkanes or oxidative coupling of methane United States Patent Application 20170313635 Kind Code:

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