

# ACID-BASE SITES REACTIVITY OF OXIDES TOWARDS EFFICIENT PROPYLENE PRODUCTION VIA ISOPROPANOL DEHYDRATION

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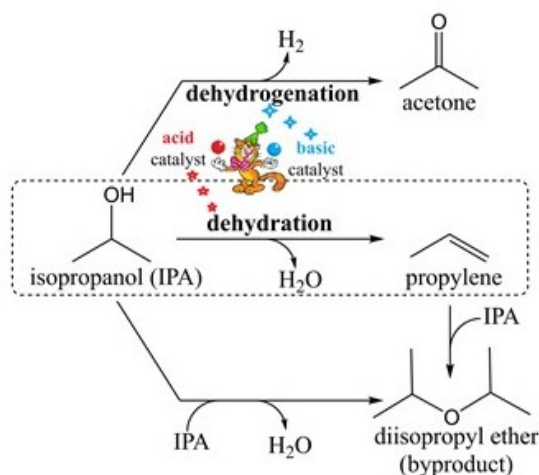
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**Summary:** Propylene is a polyvalent compound found at the root of different chemical syntheses, such as polypropylene, propylene oxide, propylene glycol, acrylonitrile and acrolein. A growing shortage of fossil resources has increased the interest in propylene synthesis from renewable raw materials [1]. The current work proposes the production of propylene through isopropanol (IPA) dehydration, which requires a catalyst with tuned acid-base properties to reduce the formation of byproducts (Fig. 1).



**Fig. 1** Propylene production from IPA

This work focused on the development of environmentally friendly acid-base catalysts for IPA dehydration to propylene. The impact of acid-base properties of tested catalysts on propylene production has been investigated by a combined approach coupling adsorption microcalorimetry [2] and catalytic testing. The optimal temperature range for IPA dehydration reaction increased with decreasing acid character of the catalysts. Catalysts having strong acid sites displayed high activity for propylene production, but could also lead to coke formation at high temperatures. Depending on the temperature and experimental conditions, the basic and amphoteric oxides could form either diisopropyl ether or acetone in a higher extent with respect to propylene. Determination of the strength and number of the active sites at the solid surface as well as their distribution is necessary to understand the catalytic properties of solids. The relationship between surface acid-base properties and catalytic reactivity of selected oxide-based catalysts will be discussed.

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## References:

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