Aerobic Carbon-Carbon Bond Cleavage of Alkenes to Aldehydes and Ketones (Yeda)

code: T4-1722

Ronny Neumann, Chemistry, Organic Chemistry

Summary

Our technology provides a new type of oxidative cleavage reaction of organic compounds with highly selective product formation.Polyoxometalate (POM) catalysts have become well-known for their utility and diversity in specific reactions. Through the elucidation of POM catalytic pathways, greater versatility has been achieved. This technology is one such application of a novel POM catalyst and is exploited to cleave carbon-carbon double bonds in alkenes (olefins) through an aerobic oxidation reaction. Oxidation reactions are of particular interest because they are difficult to achieve on an industrial scale while maintaining "green" chemistry practices.

[1]----------[1] Green Chem., 2007, 9, 717-730

Applications

As a novel catalyst in industrial organic chemistry processes
Sold as a stand-alone catalyst for laboratory or individual use

Advantages

Environmentally friendly oxidation reaction
Easy catalyst regeneration

echnology's Essence

ur approach is motivated by societal considerations that demand environmentally benign and sustainable olutions for oxidative reactions. As such, we have developed a scheme to react NO2 with a ansition-metal-substituted POM which yields a metal-nitro intermediate that is competent for forming the recursors for oxidation with molecular oxygen, O2, to have a final product of ketones and/or aldehydes, and egenerate the POM catalysts.[1]This method has preference towards di/tri-substituted alkenes. High yields of etones or aldehydes have been produced and the POM catalyst is regenerated without further oxidation to arboxylic acids, as is typical with other oxidative catalysts.The selective cleavage of carbon-carbon double or iple bonds with metal-nitro or metal-nitrito compound has not been reported. This exciting new discovery ould lead to a wide variety of organic reactions not previously possible, along with revolutionary green xidative chemistry techniques.----------[1] J. Am. Chem. Soc., 014, 136(31), pp10941-10948

ontact for more information:

aya Gofer ✉, Licensing Officer, +972-8-9344546

eda Research and Development Co. Ltd. - Technology Transfer from the Weizmann Institute. P.O. Box 95, ehovot,76100, Israel. Tel: +972-8-947-0617