Bringing the olefin metathesis transformation closer to industrial practice

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Olefin metathesis represents a powerful set of chemical transformations leading to the formation of new carbon-carbon double bonds. The success of this reaction is associated mostly with the development of specially designed and commercially available ruthenium and molybdenum catalysts displaying excellent effectiveness and stability along with functional group tolerance. This reaction has found many applications in the preparation of pharmaceuticals, agrochemicals, flavour and fragrance components, transformation of biomass into valuable chemicals, and preparation of advanced materials.

Despite the supremacy offered by the available catalysts however, there is no universal catalyst for all of the aforementioned applications. Additionally, disadvantages such as the catalyst robustness and reliability in technical grade solvents and the difficulties associated with removing the ruthenium impurities from the reaction product still remains problematic. These issues are particularly important in the industrial production of active pharmaceutical ingredients where failures in production are very costly and the products must meet stringent purity requirements.

During the lecture, problems related to application of olefin metathesis to industrial practice will be presented along with possible solutions to overcome those problems by means of design and synthesis of innovative ruthenium-based catalysts.