Application of 2-methyltetrahydrofuran as a "green solvent" in olefin metathesis reactions

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Ruthenium-catalyzed olefin metathesis reactions represent an attractive and powerful transformation for the formation of new C=C double bonds.[1] As this reaction becomes an important part of industrial processes,[2,3] there is a growing need for eco-friendly solvents that are applicable in large scale synthesis. In our study we used 2-methyltetrahydrofuran which is derived from renewable resources like oat hulls and corn cobs. These contain pentoses, which after dehydration give furfural, which is then catalytically reduced to 2-methyltetrahydrofuran.[4] 2-MeTHF is considered an environmentally friendly compound and its use is advocated by the ACS Green Chemistry Pharmaceutical Roundtable.[5]

In our research we used 2-MeTHF in the most important olefin metathesis reactions. For this study we used newly synthesized second generation Hoveyda-type catalysts **1a-c** bearing symmetrical NHC and modified styrenes, in comparison with the commercially available second generation Hoveyda catalyst **2** (figure 1). To extensively examine the performance of the catalysts, we applied them in a set of model reactions. For comparison, these catalysts were also tested in common solvents used in olefin metathesis: dichloromethane and toluene.[6]

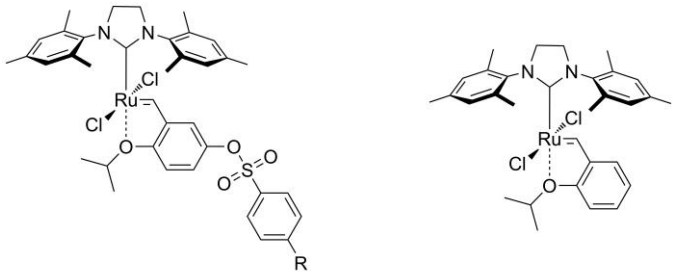

Figure 1. Newly-synthesized second generation Hoveyda-type catalysts **1a-c** and second generation Hoveyda catalyst **2**.

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