



## ORGANOMETALLICS AND NANOTECH CATALYSIS GROUP

**Biomass to bio-fuel:** Highly efficient ruthenium complexes based molecular catalysts were designed and synthesised for water based one-pot catalytic transformation of biomass components, such 2-furfural (furfural), 5-hydroxymethyl-2-furfural (5-HMF) and 5-methyl-2-furfural (5-MF) highly value added fine chemicals, such as levulinic acid (LA), and diketones, for bio-fuel application. Under a tandem catalytic condition, 1 mol% of Ru catalyst along with formic acid resulted in complete conversion of furfural to LA with high selectivity at 80 C. Experiments performed using structural analogues of the active catalyst inferred a structure–activity relationship for the observed superior catalytic activity of the studied Ru catalyst. Furthermore, due to the high aqueous solubility of the studied complexes, high recyclability, up to 4 catalytic runs, was achieved without any significant loss of activity.