Ruthenium-catalyzed self-coupling of primary and secondary alcohols with the liberation of dihydrogen - DTU Orbit (17/01/2019)

Ruthenium-catalyzed self-coupling of primary and secondary alcohols with the liberation of dihydrogen

The dehydrogenative self-condensation of primary and secondary alcohols has been studied in the presence of RuCl₂(tIPr)(p-cymene). The conversion of primary alcohols into esters has been further optimized by using magnesium nitride as an additive, which allows the reaction to take place at a temperature and catalyst loading lower than those described previously. Secondary alcohols were dimerized into racemic ketones by a dehydrogenative Guerbet reaction with potassium hydroxide as the additive. The transformation gave good yields of the ketone dimers with a range of alkan-2-ols, whereas more substituted secondary alcohols were unreactive. The reaction proceeds by dehydrogenation to the ketone, followed by an aldol reaction and hydrogenation of the resulting enone. © 2013 American Chemical Society.