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Alcohol Oxidation by Ruthenium Catalyst

Traditional oxidations of alcohols use heavy metal oxidants, resulting in noxious waste and unwanted coproducts (*Platinum Metals Rev.*, 2002, 46, (1), 26). Alternative homogeneous catalytic systems have been developed, but are limited mostly to oxidation of activated benzylic and allylic alcohols, or large amounts of additives (NaOAc, NaOH and K_2CO_3) are required.

Now, researchers at the University of Tokyo have developed an efficient heterogeneous Ru catalyst that can oxidise alcohols with 1 atm of O_2 or air, without additives (K. Yamaguchi and N. Mizuno, *Angew. Chem. Int. Ed.*, 2002, 41, (23), 4538–4542). The 1.4 wt.% Ru/ Al_2O_3 catalyst was prepared by stirring γ - Al_2O_3 with an aqueous solution of $RuCl_3$ at room temperature, and then treated with aqueous NaOH.

The Ru/ Al_2O_3 system had high catalytic activity for oxidising activated and non-activated alcohols with 1 atm of O_2 ; reaction selectivity was over 97%. Even less reactive primary alcohols (1-octanol and 1-decanol) could be oxidised. The Ru/ Al_2O_3 system is reusable, recoverable and no Ru leaching occurs, which make it a possible system for industrial use.