

## Abstract

Mesoporous sulfated-metal oxides and mixed-metal oxides prepared by a facile coprecipitation method employing titanium oxysulfate–sulfuric acid complex as a precursor of both titanium and sulfate are highly active and selective for direct methanolysis of carbohydrates to methyl levulinate. The most active sulfated  $\text{TiO}_2$ – $\text{ZrO}_2$  catalyst selectively converted fructose to methyl levulinate with a remarkably high yield (71%) after 1 h at 200 °C. Significant amounts of methyl levulinate were also obtained from sucrose (54%) and glucose (23%) after 1 h at 200 °C. The used catalyst was easily recovered and recycled without any loss of selectivity although activity decreased due to humin deposition on the surface. The spent catalysts were easily rejuvenated through calcination in air. The formation of ethers during dehydration was negligible suggesting that methanol can be recycled after distillation.