Catalytic hydrogenation of alginic acid using Ni and Ru catalysts

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Due to its structural similarity with cellulose, alginic acid, a promising chemical feedstock obtained from brown seaweed, could be converted to sugar alcohols in the same way as many studies have done on cellulose using Ru based catalysts. In this work, two types of metal loaded catalysts (Ni loaded carbon, Ru loaded zeolites) were tested to identify the effect of metal species and acid properties in catalytic hydrogenation of alginic acid. As tested with Ru loaded zeolite with different Si/Al_2 ratio, no significant trends were shown between Si/Al_2 ratio and sugar alcohol yield. Despite of the structural similarity between alginic acid and cellulose, catalytic conversion of alginic acid into hexitols were not possible via Ni loaded carbon catalysts. Instead of obtaining sugar alcohol, selective production of 1,2,5- pentanetriol (14.5% carbon yield) was possible.