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Hydrogenation of Citral over Ni and Ni-Sn Catalysts

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**Abstract:** Liquid phase citral hydrogenation over zeolite-supported monometallic Ni and bimetallic Ni-Sn catalysts was studied. The zeolite support materials were Na-Y, Na-mordenite, and clinoptilolite. Ni and Sn contents of the monometallic and bimetallic catalysts were 8.1-9.2 wt% and 0.46 wt%, respectively. The type of the zeolite support affected the activity and selectivity of the catalysts differently. The main product of the citral hydrogenation reaction was citronellal, for both monometallic (84.5% yield) and bimetallic (44.5% yield) catalysts. The addition of promoter increased the selectivity to unsaturated alcohols (geraniol+nerol), i.e. it changed from 0.9% to 6.3% over mordenite and from 0.9% to 2.1% over Na-Y-supported catalysts. Furthermore, activity of the Ni catalysts decreased while the quantity of acetal remained almost constant. Intimate contact between active metal, promoter, and support, and a catalyst with a high concentration of weak acid sites gave high selectivity to geraniol+nerol.

**Key Words:** Citral, hydrogenation, citronellol, Ni, Ni-Sn, zeolite.

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