Abstract

Silica-supported Co catalysts with different metal loadings were prepared by water-in-oil (w/o) microemulsion (ME) and tested for the selective hydrogenation of citral. The performances of the ME samples were compared to those of previously studied Co impregnated catalysts. Compared to impregnated Co catalysts, ME samples show more homogeneously dispersed Co particles, the crystallite mean size increasing with the Co content. For the ME samples, the selectivity to unsaturated alcohols (i.e. nerol and geraniol) increases with the metal content then reaches a plateau from approximately 15 wt% Co, suggesting that particles of large enough size are required to optimize the C═O group activation. Above 15 wt% Co content, the selectivity is markedly higher on the ME catalysts compared to the impregnated ones (90% versus 45–65% depending on the nature of the support). This result can be directly related to the higher proportion of β H–Co species detected by temperature-programmed desorption of hydrogen (H_2-TPD) on these ME samples.