

## Effect of iridium loading on the formation of protonic acid sites over Ir/PtHZSM5

### Abstract:

The Ir/Pt-HZSM5 with different iridium loading (0.3-1.0 wt%) was prepared by impregnation of iridium on Pt-HZSM5. The acidic properties of Ir/Pt- HZSM5 were studied by FTIR spectroscopy, while the activity of the catalysts was tested for n-pentane isomerization in a microcatalytic pulse reactor. The IR results of adsorbed 2,6-lutidine showed that all catalysts possessed strong Brönsted and Lewis acid sites in the outgassing at 473 K and below. When Ir/Pt-HZSM5 was heated in hydrogen, protonic acid sites were formed with concomitant decrease of Lewis acid sites. An increase in iridium loading continuously decreased the Lewis and Brönsted acid sites and inhibited the formation of protonic acid sites induced by hydrogen. The formation of protonic acid sites induced by hydrogen was also confirmed by the formation of electron detected by ESR spectroscopy. Additionally for n-pentane isomerization, an increase in iridium loading decreased the yield of isopentane due to the inhibition in the formation of protonic acid sites via hydrogen spillover phenomenon.