



**EFFECT OF SUPPORT NATURE, CO-METAL AND PHASE TRANSFER AGENT ON
SELECTIVE HYDRODECHLORINATION OF CHLOROBENZENES AND
p -CHLOROACETOPHENONE**

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In a process of active sites formation important role plays the metal-support interaction and the texture of support. In this work influence of the oxide nature and carbon support on the activity of Pd containing catalyst in hydrodechlorination was studied.

Zirconia stabilized by Y₂O₃, Ga₂O₂ and Al₂O₃ was used as oxide support (the content of second oxide was 1; 5 and 10 %). Catalysts were prepared by deposition-precipitation technique that allows to form Pd-Zr-O compound on the catalysts surface. The presence of both Pd⁰ and Pd^{δ+} was confirmed by TPR and IR of adsorbed CO.

Catalytic activity was tested in the multiphase hydrodechlorination of 1,3,5-trichlorobenzene (TCB) at 50°C. In a series of modified oxides supported Pd the most active were catalysts containing 1 and 5 % of modifier (Y₂O₃, Ga₂O₂ and Al₂O₃) independently on its nature. Complete trichlorobenzene dechlorination was achieved within 20 min. Moreover, catalysts on modified zirconia were more stable than catalysts on individual oxides. Total converted amount of trichlorobenzene was 500 mol per 1 mol of Pd.

Pd catalysts supported on ultra dispersed diamond (UDD) were highly active in trichlorobenzene hydrodechlorination as well. Total converted amount of trichlorobenzene was 1500 mol per 1 mol of Pd in the presence of 0.5% Pd/UDD.

According TEM micrograms UDD consists of small cores of diamond (average size 4 nm) which were combined in aggregates by amorphous carbon. Average size of aggregates is 20 nm. This type of UDD structure favors stabilization of active Pd particles, size about 5-7 nm.



Comparing specific catalytic activity for Pd/UDD and mean metal particle size, strong electronic influence of UDD on supported metal was found. Such close interaction between metal and support is not typical for carbon supports.

Possibility of selective hydrodechlorination in the presence of reducible functional groups was studied in hydrogen treatment of *p*-chloroacetophenone, as a model substrate. For example, in the presence of 2%Pd/(5%Ga₂O₃+ZrO₂) under multiphase conditions the reaction stops at methylphenylcarbinol formation. It was established that under multiphase hydrogen treatment of *p*-chloroacetophenone the presence of phase transfer agent and oxide-modifier nature Aliquat 336, the leads to the formation of chloroacetophenone as the only product after 1 hour of the reaction.

In such a way it was shown that in the reductions *p*-chloroacetophenone over Pd-containing systems with hydrogen under multiphase conditions the co-metal and the component constituting the multiphase environment, namely the phase transfer agent have great influence over the reaction rate and selectivity.

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