Influence of preparation procedure on physical and catalytic properties of zirconia supported Pd-Au samples

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The hydrogen peroxide direct synthesis from H_2 and O_2 is a promising alternative to the actual anthraquinone technology, but it never found industrial application because of selectivity and security problems. In this work Pd-Au/ZrO_2 catalysts were prepared by different methods and tested for the H_2O_2 direct synthesis under very mild conditions (RT and atmospheric pressure) and outside the explosion range[1,2]. The effect of gold addition to Pd in enhancing the yield of H_2O_2 is sensitive to the preparation method: best results were obtained depositing gold by deposition precipitation and introducing in a second step Pd by incipient wetness impregnation. The origin of the differences were discussed by FTIR results together with HRTEM measurements. The role of Au seems to be a complex one, improving the performance of Pd particles changing their morphology and electron density.

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