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Effect of (Pd, Cu, Zn)- γ -Al₂O₃ catalysts on autothermal methanol reforming for hydrogen production

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The development of fuel cell has lead to the exploration of possible route for hydrogen production. One of a viable route is through methanol reforming. This has the advantage of supplying hydrogen on demand when a reformer is incorporated onboard and give greater mileage. A suitable catalyst is required for the selective methanol reforming to produce hydrogen at low temperature and pressure to be coupled to the fuel cell. Combinations of Pd-Cu-Zn supported on γ -Al₂O₃ catalysts were prepared by incipient wetness impregnation method and had been characterized by (BET) for surface area, (SEM) for shape and dispersion of metals, (XRD) for species present and degree of crystallinity and (TPR) for reducible species presence, their interaction and degree of reducibility. The activity tests to determine the effect of catalysts were carried out in a micro reactor. The products from the reactor were analyzed by GC connected online. The activity tests show that the catalysts were active for hydrogen production by autothermal reforming of methanol at 280 °C with the specified feed conditions and PdCu/ γ -Al₂O₃ catalyst had the highest hydrogen concentration.