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บทคัดย่อภาษาอังกฤษ

In this research cluster $[PPh_4]_4[Pd_{13}Ni_{13}(CO)_{34}]$ was utilized as a precursor for heterogeneous catalyst preparation in which the solution of cluster was deposited on silica by impregnation technique. The efficiency of calcination temperature to remove carbonyl ligands and $[PPh_4]^+$ cation was investigated. In addition, catalysts will be prepared from a mixture of palladium and nickel acetate to use for property comparison. Both chemical and physical properties of the resulting catalyst materials were investigated by many techniques including Powder X-Ray Diffraction (XRD) for metal phase determination; Scanning Electron Microscopy (SEM) for catalyst surface exploration; BET Surface Area Analysis for surface area and pore volume determination; and X-Ray Fluorescence (XRF) for metal loading comfirmation. The reduction temperature of catalysts from both preparations were also studied by Temperature Programmed Reduction (TPR) technique compared to the single metal catalyst reference. It was found that catalysts prepared from clusters have desired properties including small metal particles with good metal dispersion. Calcination temperature of 400°C is enough to remove carbonyl ligands and phosphonium cation. In addition, TPR results indicated that palladium was still intact with nickel and lower the reduction temperature of nickel. The catalysts prepared from cluster have good metal dispersion with small metal particles.