

Voltammetric Study of CO₂ adsorption on carbon-supported Pd-Pt core-shell nanoparticles

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The relative surface concentration of Pt in Pd-Pt core-shell nanoparticles can be calculated from the changes in the oxidation charge of “reduced CO₂”, which has the selective adsorption phenomena on Pt and Rh electrode surfaces. The growth mode of Pt-shell on the surface of core (Pd) nanoparticles was investigated from the CO₂ selective adsorption and the following oxidation charge. The mass_{Pd}-normalized relative surface coverage of Pt increased with the increase of the Pt loading. This result strongly support that additional Pt atoms are used for covering exposed Pd atoms. Therefore, the CO₂ adsorption behavior on alloy nanoparticles can act as an indirect probe for the determination of surface Pt concentration in Pt-based alloy nanoparticles.