

### Chelating agent effect on the synthesis of carbon supported Pt nanoparticles

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Colloidal suspensions of spherical crystalline Pt nanoparticles with a narrow size distribution were synthesized using a microwave synthesis process. Analogous Pt-complexes (Pt(dien)<sup>2+</sup>, Pt(trien)<sup>2+</sup>, and Pt(en)<sub>2</sub><sup>2+</sup>, where dien = diethylenetriamine, trien = triethylenetetraamine, en = ethylenediamine) were deposited onto Vulcan XC-72 carbon powder to obtain Pt/C-x catalysts (x = 3, 4, and 22 represents the coordination number of the chelating agent). The Pt/C-x catalysts were evaluated under PEMFC conditions. X-ray diffraction and transmission electron microscopy were used to characterize the Pt/C-x catalysts. It was found that the Pt nanoparticles were uniform in size and highly dispersed on the carbon black supports. The chelating agents were expected to improve the growth of Pt particle size as well as the dispersion of Pt nanoparticles. In the PEMFC experiments, the mass-specific current density and mass-specific power density of the catalysts were as high as that of the commercial 20wt.% Pt/C-ETEK catalyst.

**Key words:** Chelating agent assisted; PEMFC; Catalysts; Pt nanoparticle; Microwave synthesis



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