Effect of Deposition Potential on the Structure, Electrocatalytic Activity and Stability of Pt Films for Methanol Oxidation

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The effect of deposition potential on the structure and electrocatalytic properties of Pt films electrodeposited on Ti was investigated. By controlling a constant deposition potential either at -0.15 V, -0.20 V, -0.25 V or -0.30 V, various shapes of Pt structures such as cauliflower-like, durian-like, needle-like and worm-like can be observed by FESEM. The face-centered cubic (fcc) structure of all the prepared Pt films was confirmed by XRD. The highest specific electrochemically active surface area (ECSA) was obtained for Pt films with durian-like shape prepared at -0.2 V with $6.0 \text{ m}^2 \text{ g}^{-1}$ which gave the best catalytic activity and stability for methanol oxidation in alkaline medium.

Keywords: Pt films, electrodeposition, methanol oxidation, electrocatalytic activity

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