

Cyclic voltammetric behavior of Ac-Ni

In addition to the redox peaks of ferri/ferro hexacyanide ions, a pair of undefined peaks was observed at the voltage around 0.7 V in Fig. 7e. These peaks can be ascribed to the redox reactions of nickel-containing compounds eluted from Ni metals, since these peaks were observed in another experiment using a pure Ni plate as a working electrode. Pinholes, such as broken nanorods would be the reason why such peaks were observed, but such broken ones were rarely found by the SEM observation. In addition, ΔE_p was far larger for CVD-Ni than the case with the Ni plate (for example, ΔE_p was 162 mV for CVD-Ni, and was 80 mV for the Ni plate at the sweeping rate of 100 mVs^{-1}), suggesting that the surface of CVD-PVC is less active than the Ni plate. These facts indicate that the electrochemical reactions mainly occurred on the surface of the carbon covering the Ni core.