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Performance Evaluation of Nickel Oxide Electrode  
Used as a Supercapacitor by Analysis of Cyclic Voltammogram  
and Potential Sweep Curve

순환전류법과 전위 주사법의 분석을 통한 Supercapacitor로  
사용되는 산화 니켈 전극의 성능평가에 관한 연구

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Performance of pure and cobalt oxide-incorporated nickel oxide electrodes as a supercapacitor has been evaluated as a function of amount of incorporated cobalt oxide employing cyclic voltammetry and potential sweep method. Pure and cobalt oxide-incorporated nickel oxide electrodes were obtained from heat treatment of nickel hydroxide, which is electrochemically deposited onto a pure nickel plate by application of a dc-current density of  $0.5 \text{ mA cm}^{-2}$  for 830 s in the 0.05 M  $\text{Ni}(\text{NO}_3)_2$  solution containing various concentration of  $\text{Co}(\text{NO}_3)_2$ . Porous nickel oxide films were also synthesized by sol-gel technique. These prepared electrodes were characterised by XRD and SEM complemented with EDS. After that, cyclic voltammogram and potential sweep curve were obtained in the potential range of  $-0.1$  to  $0.5 \text{ V}_{\text{SCE}}$  in 1M KOH solution. From the experimental results, it is found that the manufactured nickel oxide electrodes exhibit redox pseudocapacitance like ruthenium oxide and good reversibility of their discharging process. These experimental results were discussed in terms of the capacitance and the reversibility of nickel oxide electrode.