

### Characteristic of Hydrogen permeation of Anodized Nickel oxide/Nickel Composite membrane

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Nickel oxide/Nickel composite membranes were successfully prepared by anodizing. For the electrolyte, distilled water and ethylene glycol were used as solvent, and  $\text{NH}_4\text{F}$  was used as the main source of  $\text{F}^-$  ions. XRD analysis showed that NiO crystal was grown by anodizing. The hydrogen permeability of Ni, NiO/Ni and Pd coated NiO/Ni membrane was measured under various temperatures (400~600°C) and pressures (2~5bar). The results show that the hydrogen permeability of NiO/Ni composite membrane was higher than that of a Ni membrane, and hydrogen permeability was increased according to Pd coating on the composite membrane. NiO layers which were introduced between Pd and Ni by anodizing effectively suppress the metal-metal interdiffusion.