

<b>NAME. &amp; FACULTY</b> ONO Yasushi and YASUDA Morihiro Faculty of Engineering, Materials Science and Technology		<b>TITLE</b> Preparation of a Binary Type Composite Plated Cathode with Large Surface Particles and Hydrophobic Fine Particles for Hydrogen Evolution Reaction.			
<b>FIELD</b>	<b>IT</b>	<b>NANO</b>	<b>BIO · LIFE</b>	<b>· ENVIRO · ENERGY</b>	<b>OTHERS</b>

**ABSTRACT** For the purpose of mass-production of highly pure hydrogen, the cathodes with large surface area for the water electrolysis have been developed. However, this condensation of active sites for hydrogen evolution reaction (HER) conducts supersaturation of hydrogen evolved on the electrodes, therefore additional potential application is necessitated. To break through this issue, a new high-performance cathode for HER was developed by composite-plating of Ni with Raney nickel and poly(tetrafluoroethylene) (PTFE) onto cathode substrate. Raney nickel and PTFE particles were employed to provide large surface area and supersaturation eliminator, respectively. This cathode exhibits much lower hydrogen overvoltage than that of nickel cathode(see figure). This electrode also has durability for HER since the particles were tightly embedded onto the electrode surface by composite-plating.

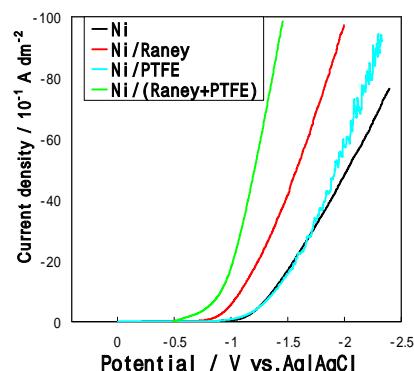


Fig. I-E curves for HER on the composite-plated electrodes.

**Flow Chart for Strategic Partnership University-Industry-Government to be Developed**

