Supporting Information

Synthesis of Nickel Germanide (Ge$_{12}$Ni$_{19}$) Nanoparticles for Durable Hydrogen Evolution Reaction in Acid Solutions

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Figure S1. SEM images of Ge$_{12}$Ni$_{19}$ nanoparticles sonicated in four different washing solvent: (a - c) THF, (d - f) toluene, (g - i) acetic acid, and (j - l) Saturated NaBH$_4$ in THF for different time: (a, d, g, h) 30 minutes, (b, e, h, k) 60 minutes and (c, f, i, l) 90 minutes.
The calculation for the energy conversion.

Electrolysis voltage  $= 2.2 \text{ V}$

Electrolysis current  $= 120 \text{ mA}$

Consumption wattage $= 2.2 \text{ V} \times 0.12 \text{ A}$

$= 0.264 \text{ W}$

Hydrogen evolution rate $= 0.12 \text{ A}$

$= 5.7 \times 10^{-7} \text{ mol s}^{-1}$

$= 0.163 \text{ J s}^{-1}$

$= 0.063 \text{ W}$

Electrolysis efficiency $= \frac{\text{Hydrogen evolution rate}}{\text{Consumption wattage}}$

$= \frac{0.163 \text{ W}}{0.264 \text{ W}}$

$= 61.7 \%$