Supporting Information

The effect of external magnetic field on dealloying process of Ni-Al alloy in alkaline solution

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Experimental section

The master alloy of $Al_{80}Ni_{20}$ (at.%) in our study is prepared from aluminum (Al) rod (purity 99.99 wt.%, CNM) and nickel (Ni) rod (purity 99.99 wt.%, CNM). In order to obtain a uniform master alloy, all metals are melted in a copper crucible with the help of electromagnetic stirring in the high purity argon gas (99.99%) using a vacuum arc furnace. The as-obtained ingots are then re-melted in a quartz tube with a nozzle diameter of 1.1 mm and then solidified onto a copper roller at a speed of 2500 rpm by a single roller melt spinning apparatus under the atmosphere of high purity argon gas. The obtained Ni-Al ribbons are typically 40~60 μm in thickness and 2~4 mm in width.

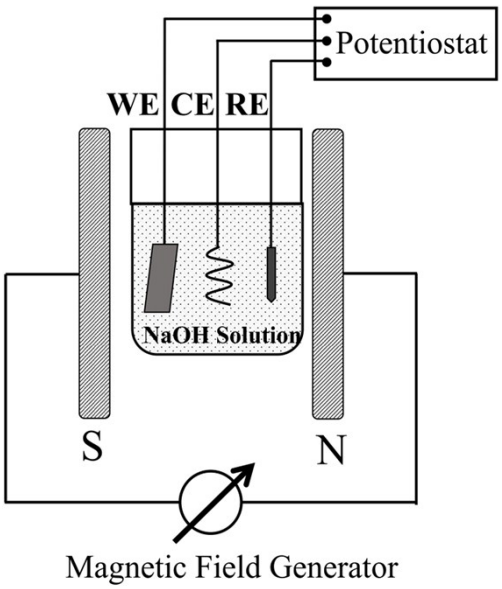

Figure S1. Schematic diagram of electrochemical cell with an external magnetic field. WE: working electrode, CE: counter electrode, RE: reference electrode. The magnetic flux density is adjusted from 0 T to 0.5 T. The working electrolyte is 2 M NaOH.

The schematic diagram of experimental installation is shown in Figure S1. Electrochemical measurements are carried out with a typically three-electrodes system: the $Al_{80}Ni_{20}$ precursor ribbon as working electrode, silver wire as counter electrode and a commercial Ag/AgCl electrode as reference electrode. The open circuit potential (OCP) is recorded by a potentiostat (CHI760E) during whole dealloying process. The microstructures of specimens are characterized by X-ray

diffractometer (XRD, Rigaku D/max-rB) with Cu Kα radiation and a scanning electron microscope (SEM, Quanta FEG 250) with an energy dispersive X-ray spectroscopy (EDS).. In our study the direction of magnetic field is perpendicular to the surface of working electrode. Before electrochemical tests, the specimens and electrochemical cell are carefully washed with deionized water (18.2 MΩ cm), followed by ultrasonic cleaning in deionized water. The Ni-Al ribbon is then dealloyed in aqueous solution of 2M NaOH at room temperature for 2 hours under an external magnetic field with different intensity.