

Electronic Supplementary Information for

Design and Fabrication of Ni Nanowires having Periodically-Hollow nanostructures

Takao Sada,*^a Tsuyohiko Fujigaya*^{a,b} and Naotoshi Nakashima*^{a,b,c}

^a Department of Applied Chemistry, Graduate School of Engineering, Kyushu University, 744 Motooka, Nishi-ku, Fukuoka 819-0395, Japan. Fax: +81-92-802-2840; Tel: +81-92-802-2840; E-mail: nakashima-tcm@mail.cstm.kyushu-u.ac.jp

^b JST-CREST, 5 Sanbancho, Chiyoda-ku, Tokyo, 102-0075, Japan.

^c Department of Mechanical Engineering Science, Graduate School of Engineering, Kyushu University, 744 Motooka, Nishi-ku, Fukuoka 819-0395, Japan.

E-mail: nakashima-tcm@mail.cstm.kyushu-u.ac.jp; fujigaya-tcm@mail.cstm.kyushu-u.ac.jp

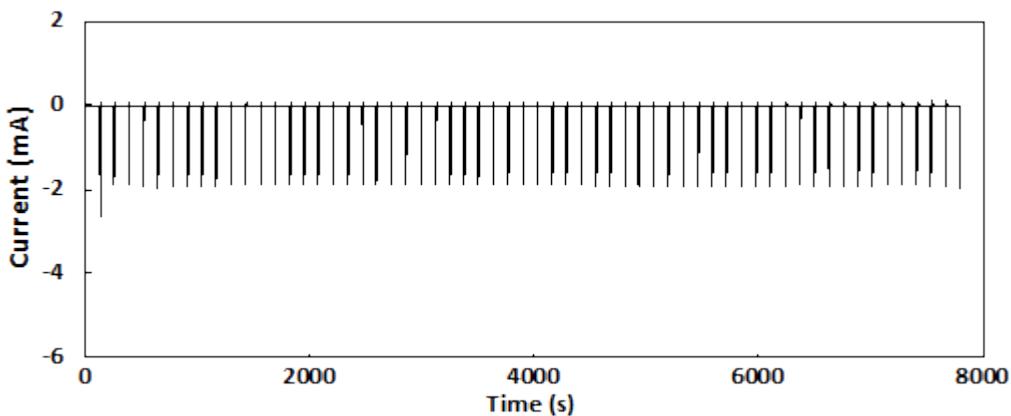


Fig. S1 Current profile as a function of time monitored during electroplating at alternating applied potential of -0.4 V for 120 s and -1 V for 15 s to deposit Ag and Ni, respectively. The electroplating cycles were repeated 60 times.

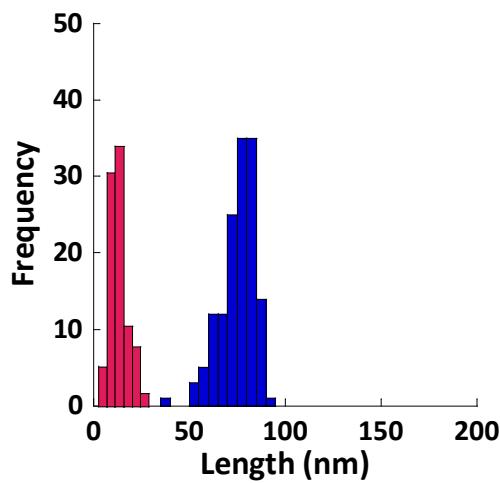


Fig. S2 Histogram for the length of the Ni segment (blue) and nanopores (pink) along the longitudinal direction.

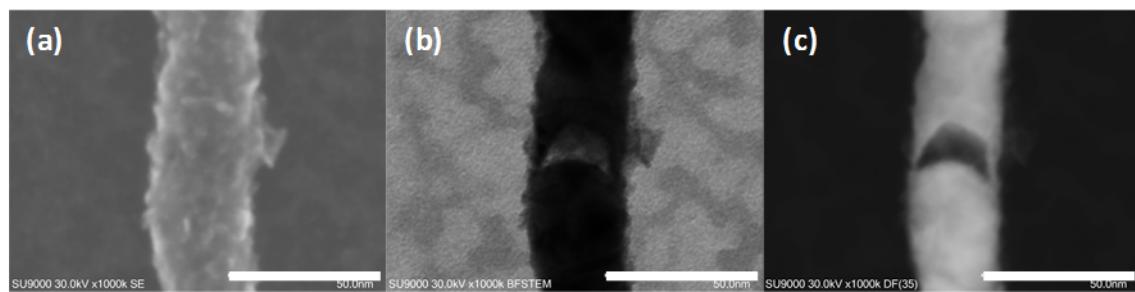


Fig. S3 (a) SEM, (b) bright-field and (c) dark-field STEM images of the Ni nanowires after dissolving Ag segments. Scale bar: 50 nm.

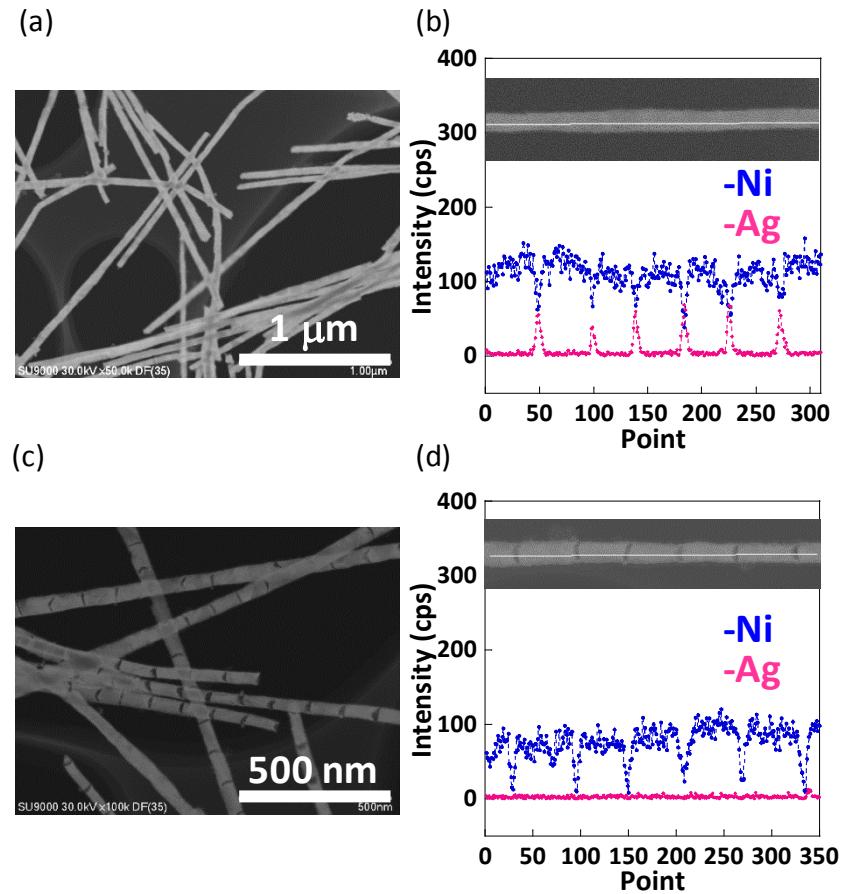


Fig. S4 (a, c) STEM images of Ni-Ag nanowires (a) before and (c) after dissolving the Ag segments. (b, d) EDX line profiles for Ni (blue) and Ag (pink) of the Ni-Ag nanowires (b) before and (d) after dissolving Ag segments displayed in inset (STEM image) along its longitudinal direction (indicated by the white line in the inset). The pore diameter of the AAO membrane used to prepare the nanowires was 35 nm.

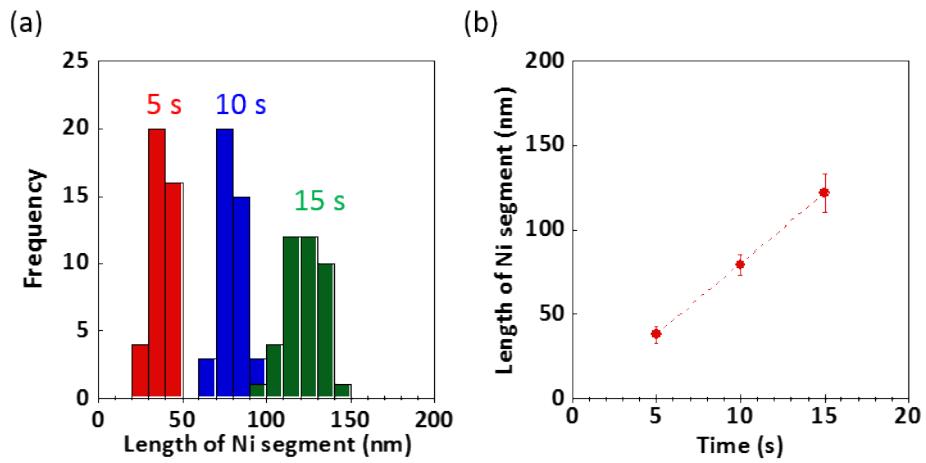


Fig. S5 (a) Histogram for the length of the Ni segment along the longitudinal direction after electroplating for 5 (red), 10 (blue) and 15 (green) sec. (b) Length of the Ni segment as a function of deposition times.

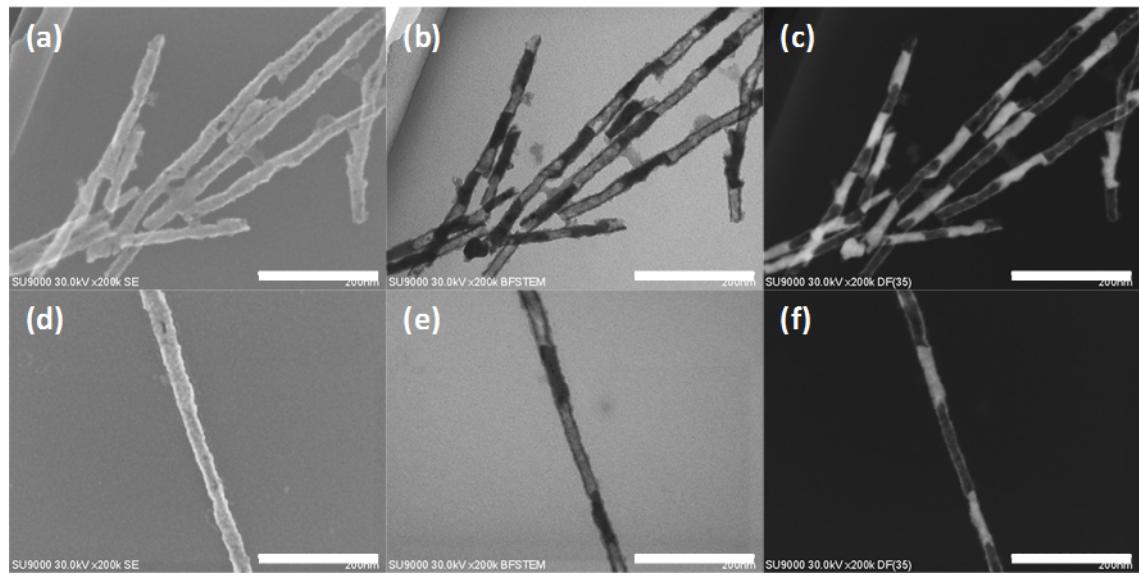


Fig. S6 (a, d) SEM, (b, e) bright-filled and (c, f) dark-filled STEM images of Ni nanowires having large cavities fabricated in an electrolyte solution containing a high concentration of Ag ions. Scale bar: 200 nm.