Supplementary Materials

Effect of Annealing Temperature of Ni–P/Si on its Lithiation and Delithiation Properties

Yasuhiro Domi,[a,c,*] Hiroyuki Usui,[a,c] Ayumu Ueno,[a,c] Yoshiko Shindo,[a,b] Hayato Mizuguchi,[a,c] Takuro Komura,[a,c] Toshiki Nokami,[a,b] Toshiyuki Itoh,[a,b] and Hiroki Sakaguchi[a,b,z,*]

[a] Department of Chemistry and Biotechnology, Graduate School of Engineering, Tottori University, Minami 4–101, Koyama–cho, Tottori 680–8552, Japan

[b] Course of Chemistry and Biotechnology, Department of Engineering, Graduate School of Sustainability Science, Tottori University, Minami 4–101, Koyama–cho, Tottori 680–8552, Japan

[c] Center for Research on Green Sustainable Chemistry, Tottori University, Minami 4–101, Koyama–cho, Tottori 680–8552, Japan

* Electrochemical Society Active Member.

[z] Corresponding authors:

E–mail address: sakaguch@chem.tottori–u.ac.jp (Hiroki Sakaguchi)

Tel/Fax: +81–857–31–5265

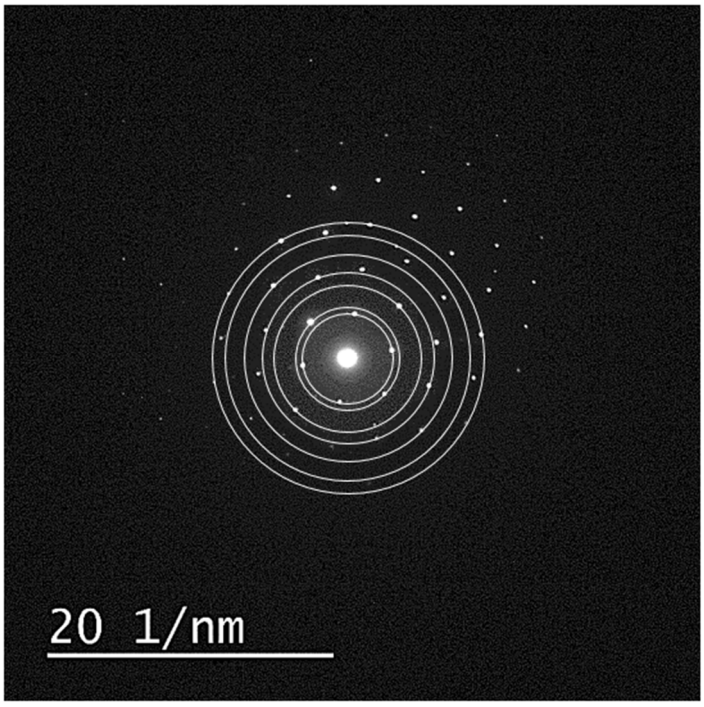

Figure S1 SAED pattern of Ni-P/Si particle annealed at 800°C.

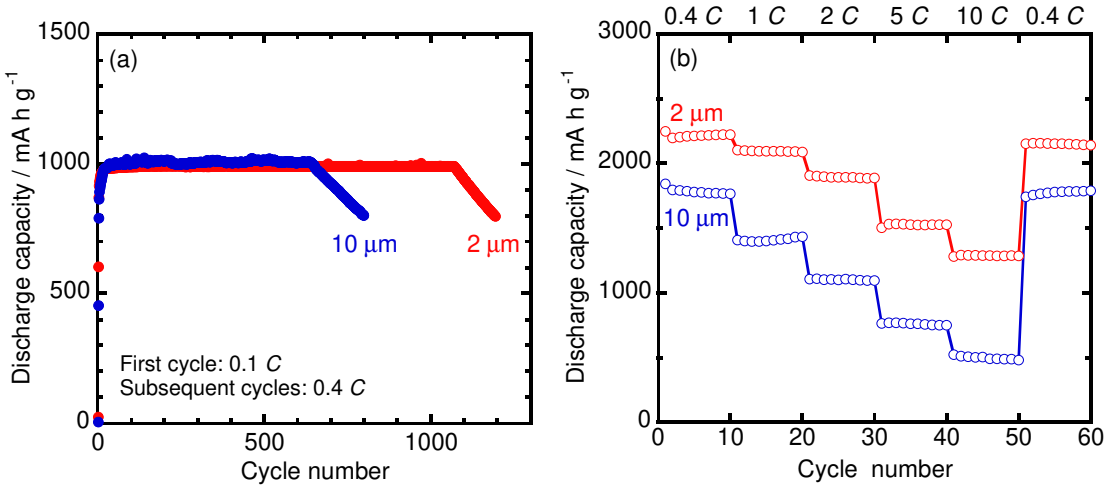

Figure S2 (a) Cycle life and (b) rate performance of Ni–P/Si electrodes annealed at 800°C in 1 M LiFSA/Py13-FSA.

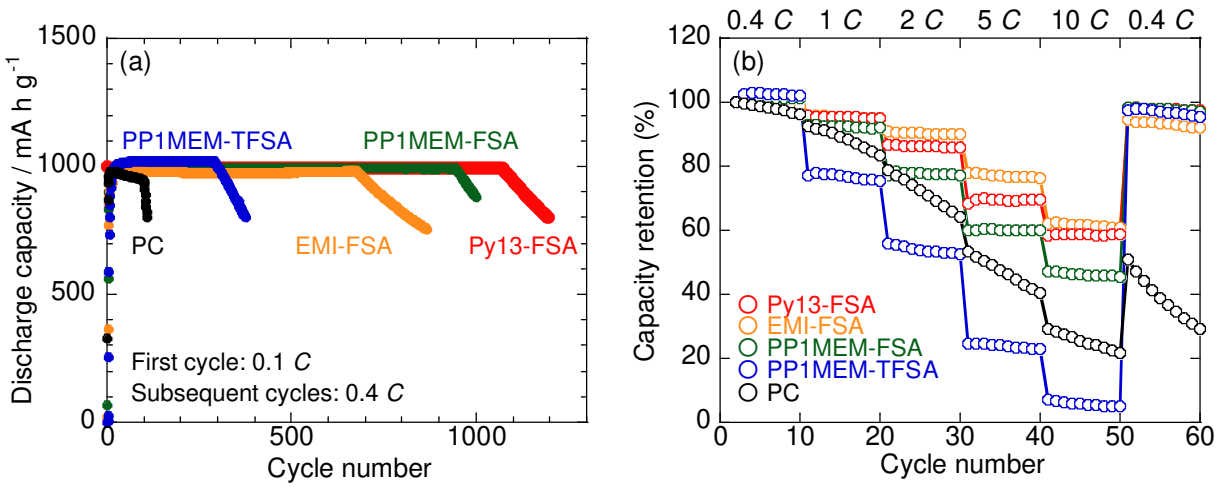

Figure S3 (a) Cycle life and (b) rate performance of Ni–P/Si electrodes annealed at 800°C in various electrolytes. Vertical axis of part (b) is denoted as capacity retention. The cation and anion structures of ionic-liquids used in this study are illustrated in Figure S4. The ionic-liquid electrolyte was 1 mol dm^{-3} (M) LiFSA or LiTFSA dissolved in the ionic-liquid with the same anion of Li salt. For comparison, 1 M LiTFSA dissolved in propylene carbonate (PC, Kishida Chemical Co., Ltd.) was also used as a conventional organic electrolyte.

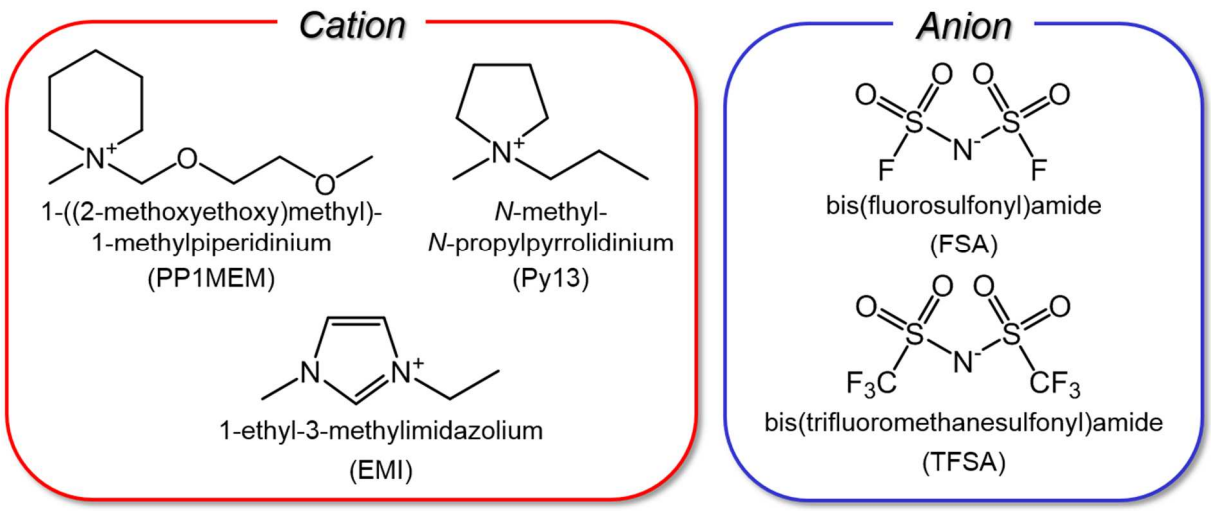

Figure S4 Cation and anion structures of ionic liquids used in this study.