Formation of Ultrathin Birnessite-Type Nanoparticles Immobilized on Spherical Polyelectrolyte Brushes

Supplementary Material

Frank Polzer,[§] *Daniel A. Kunz,*[‡] *Josef Breu,*[‡] *Matthias Ballauff*[§*]

[§]Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Hahn-Meitner-Platz 1, 14109 Berlin, Germany, and Department of Physics, Humboldt University Berlin, Newtonstr. 15, 12489 Berlin, Germany.

[‡] Department of Inorganic Chemistry I, University of Bayreuth, 95440 Bayreuth, Germany

(Matthias.Ballauff@helmholtz-berlin.de)

RECEIVED DATE (Jan 22, 2010)

Supporting Information

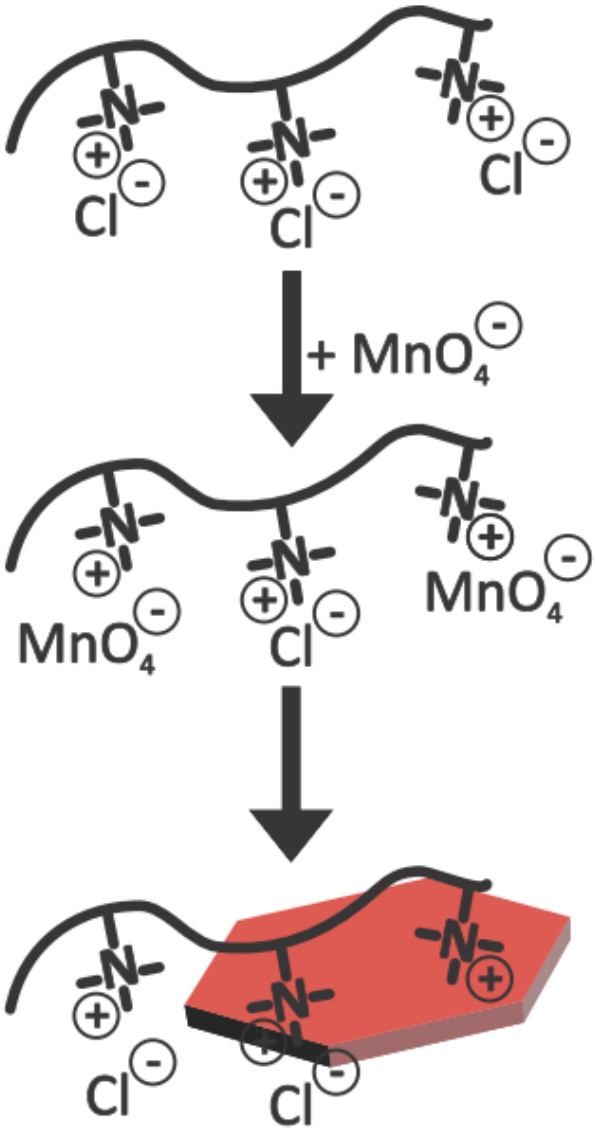


Figure S1. Proposed mechanism for the MnO_2NP generation at SPB. By adding $KMnO_4$ solution to the SPB dispersion, a pTMAEMC/MnO_4 precursor is formed which gets instantly reduced inside the brush layer. As a consequence, birnessite-type MnO_2NP (red hexagon) are generated which are stabilized by the polyelectrolyte chains of the SPBs.

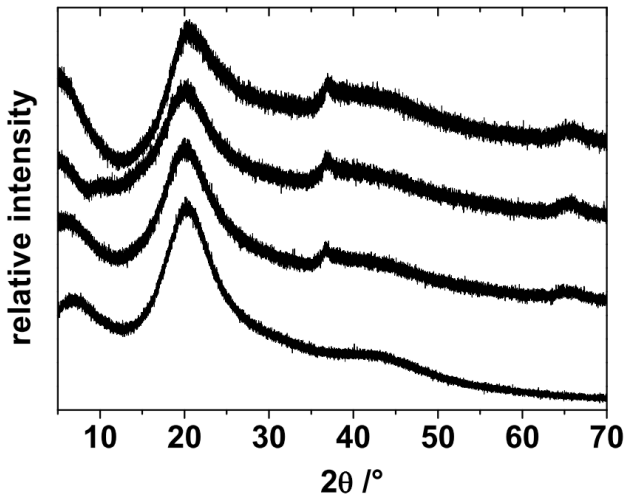
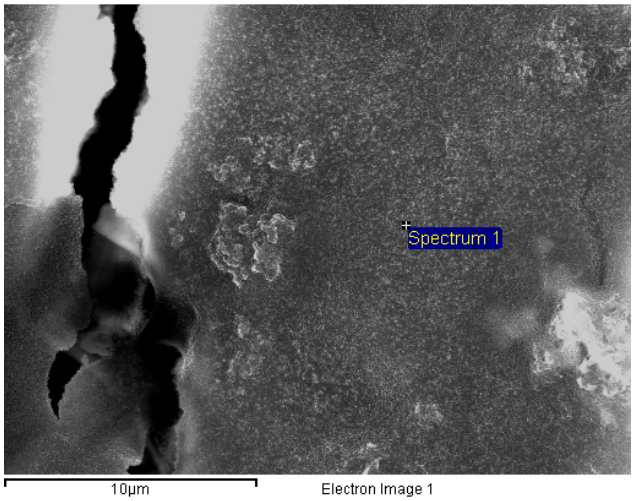


Figure S2. PXRD patterns of the bare SPB pTMAEMC-40 and the composite systems SPB-MnO_2-5, SPB-MnO_2-8 and SPB-MnO_2-9 from undermost to uppermost curve. The *hk*-bands of the composite systems refer to the birnessite nano-needles that exhibit only a 2D order within the *ab*-layer plane.

(a)



(b)

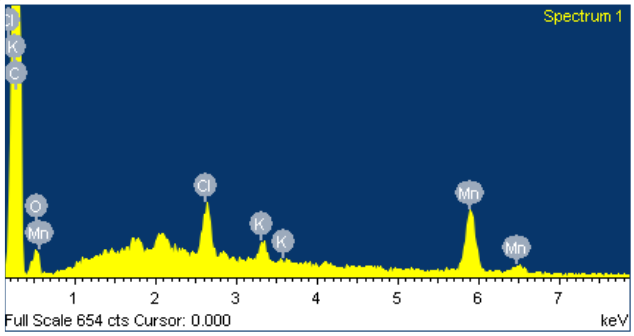


Figure S3. (a) SEM image of the sample SPB-MnO_2-8 and (b) the corresponding EDX pattern that indicates the formation of the MnO_2NP with K^+ ions inside the interlayers of birnessite.