Supporting information

Rigid Bolaform Surfactant Templated Mesoporous Silicon Nanofiber for Lithium Energy Storage

Dongpo Xu, Zhehao Huang, Rongrong Miao, Yitian Bie, Jun Yang*, Yaoyuan* and Shunai Che*

Figure S1. Thermogravimetric curve of the nf-Si@C.

Figure S2. Possible packing configuration of the surfactants in the lamellar silica framework.
Assuming that the electron density accumulates at the center of silica wall and center of the template, and the scattering factors are Si(z) and T(z) respectively, then:

For 1D crystal, \( C_r = \{ B(z) \cdot H(x,y) \} * \{ L(z) \cdot S(z) \} \)

Herein, \( B(z) = Si(z) + T(z) \);

The structure factor in the reciprocal space, \( F(C_r) = F(Si(z) + T(z)) \cdot F(L(z)) \cdot F(S(z)) \), therefore,

\[
F(k) = f_{Si}(k)e^{2\pi ikz} + f_{template}(k)e^{2\pi ik(z+d/2)}
\]

The first reflection:

\[
F_{1st} = [f_{Si}(k) - f_{template}(k)]
\]

The second reflection:

\[
F_{2nd} = [f_{Si}(k) + f_{template}(k)]
\]

When \( f_{Si}(k) = f_{template}(k) \), the intensity of the first peak will be zero. This is can be regarded as lattice centering, which is different from the accidental extinction.