Supporting Information

for

Unravelling the interfacial interaction in mesoporous SiO$_2$@nickel phyllosilicate/TiO$_2$ core–shell nanostructures for photocatalytic activity

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*Beilstein J. Nanotechnol.* **2020**, *11*, 1834–1846. doi:10.3762/bjnano.11.165

Additional experimental results
Table S1: Summary of atom % concentration for the Si 2p, Si 2s, O 1s, Ni 2p, Ni 2s and Ti 2p spectra in the samples.

| Sample name          | Peak  | Binding energy (eV) | concentration (atom %) |
|----------------------|-------|---------------------|------------------------|
| mSiO₂@NiPS           | Si 2p | 103                 | 2.21                   |
|                      | Si 2s | 154                 | 2.08                   |
|                      | C 1s  | 285                 | 69.24                  |
|                      | O 1s  | 532                 | 19.53                  |
|                      | Ni 2s | 977                 | 6.72                   |
|                      | Ni 2p | 856                 | 0.21                   |
| mSiO₂@NiPS/TiO₂      | Si 2p | 102                 | 0.85                   |
|                      | Si 2s | 153                 | 0.90                   |
|                      | C 1s  | 285                 | 76.52                  |
|                      | O 1s  | 532                 | 19.69                  |
|                      | Ni 2s | 1000                | 1.93                   |
|                      | Ti 2p | 459                 | 0.10                   |

Figure S1: SEM images of (a) mSiO₂, (b) mSiO₂@NiPS and (c) mSiO₂@NiPS/TiO₂ core–shell nanomaterials.
Figure S2: (a) XRD patterns mSiO$_2$ and mSiO$_2$@NiPS, (b) N$_2$ adsorption–desorption isotherm of TiO$_2$ and (c) FTIR spectra of mSiO$_2$, mSiO$_2$@NiPS and mSiO$_2$@NiPS/TiO$_2$. 
Figure S3: EDX spectra of the mSiO$_2$@NiPS and mSiO$_2$@NiPS/TiO$_2$ core–shell nanomaterials.

Figure S4: Wide-scan survey spectra of (a) mSiO$_2$@NiPS and (b) mSiO$_2$@NiPS/TiO$_2$ nanomaterials.