Supporting materials for PCCP

Complex Three-Dimensional Polymer-Metal Core-Shell Structures towards Emission Control

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Calculation of the reflection and absorption spectra

To confirm our experiment results, we simulate the reflection and absorption spectra of the studied structure by using the well-known scattered matrix method. The scattered matrix calculation is performed on the DiffractMOD module of Rsoft package [S1]. For simplicity in modeling, the whole structure is considered as nickel. This is because that the nickel layer in experiment is around 200 nm-thick so that the incidence with wavelength of 4~5 μm could not penetrate through it. The results are shown in Fig. S1, where the solid line and dashed line correspond to the reflection and absorption spectra, respectively. As it shows, the photonic stop gap is present at λ～ 4.60-4.85 μm. The absorptivity exhibits two pronounced peaks at the band edges of λ ～ 4.45 μm and 4.89 μm. It can be found that the simulation results are close to the experimental result shown in Fig. 5(a). The difference may come from the approximation in simulation and the shrinkage of the resin after exposal in experiment.

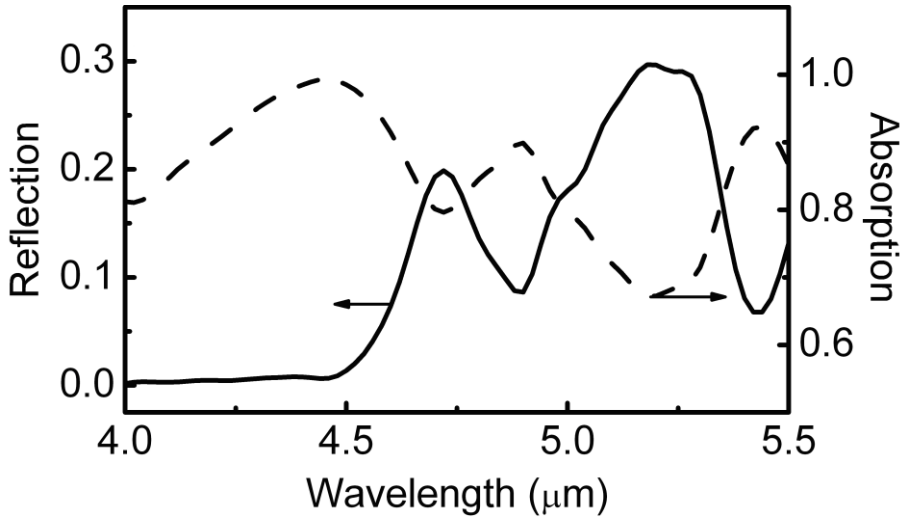

Figure S1 Simulation reflection spectra (solid line) and absorption spectra (dashed line) of 3D graphite structure used in experiment.

References:

[S1] DiffractMOD, Rsoft Inc. Research Software, http://www.rsoftinc.com.