

Supporting Information

High Q refractive index sensor with graded-lattice heterostructure of anodic aluminum oxide photonic crystal

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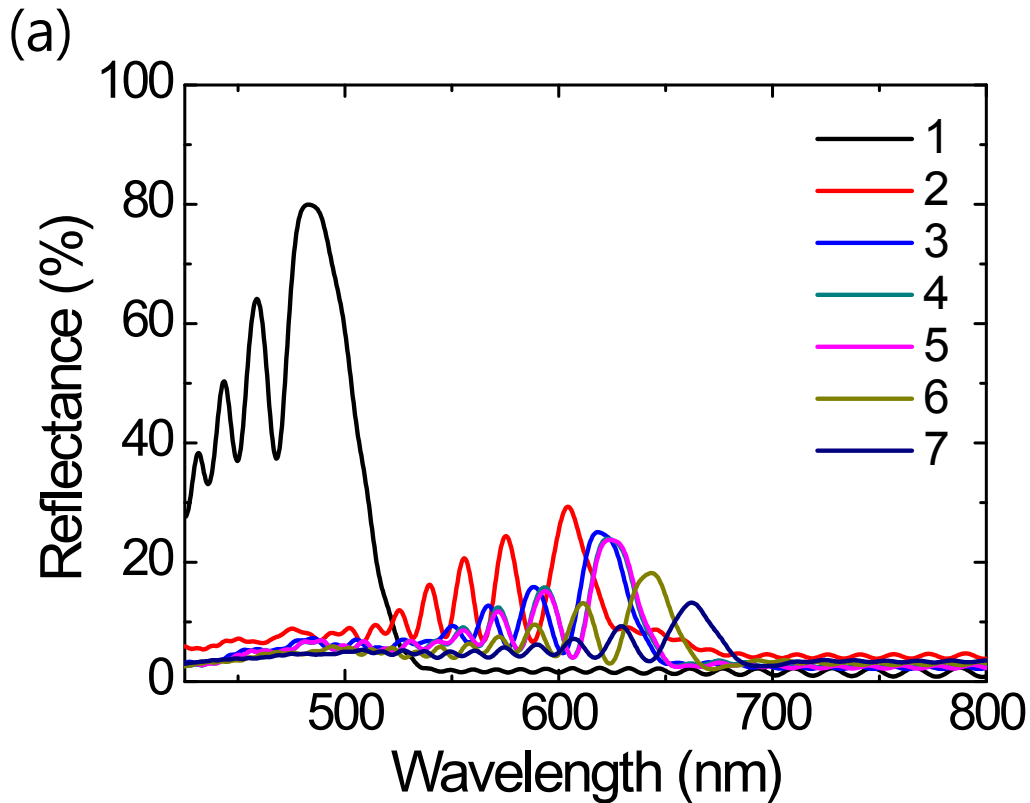
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1. Reflectance spectra of anodic aluminium oxide (AAO) photonic crystal heterostructures (PCH) fabricated at electrolyte temperatures of 14.5°C, 15°C, and 15.5°C.

The AAO graded-lattice PCH has different reflectance spectra depending on the electrolyte temperature during the anodization process. Therefore, it is possible to choose the best spectrum appropriate to analyte's refractive index sensing. Fig. S1 shows the reflectance spectra of the PCHs fabricated at (a) 14.5°C, (b) 15°C, and (c) 15.5°C, respectively. We observe that the overall spectra shift to longer wavelength with increasing anodization electrolyte temperature. The tested electrolytes are: air (1, $n=1$), water (2, $n=1.3323$), anhydrous ethanol (3, $n=1.3606$), anhydrous n-hexane (4, $n=1.3719$), isopropyl alcohol (5, $n=1.3742$), cyclohexane (6, $n=1.4225$), and trichloroethylene (7, $n=1.4777$), respectively. The refractive index sensitivity, which is obtained by the linear regression of the peak shift of the first order side band, reaches up to $d\lambda/dn \sim 359\text{nm/RIU}$, 385 nm/RIU and 441 nm/RIU for this AAO PCH fabricated at 14.5°C, 15°C, and 15.5°C electrolyte temperature, respectively.



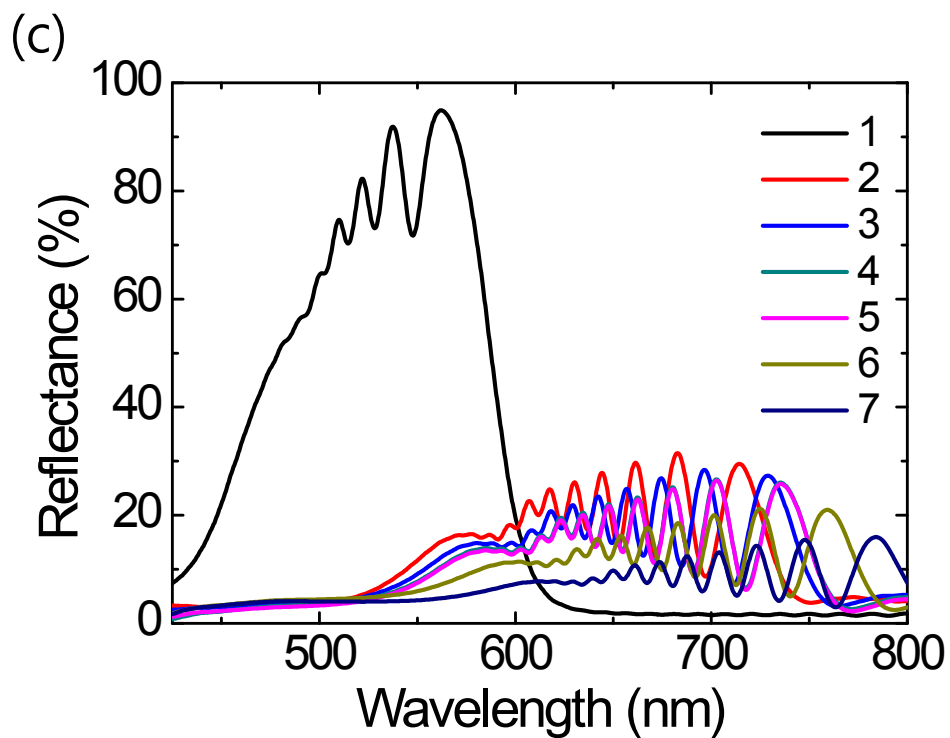
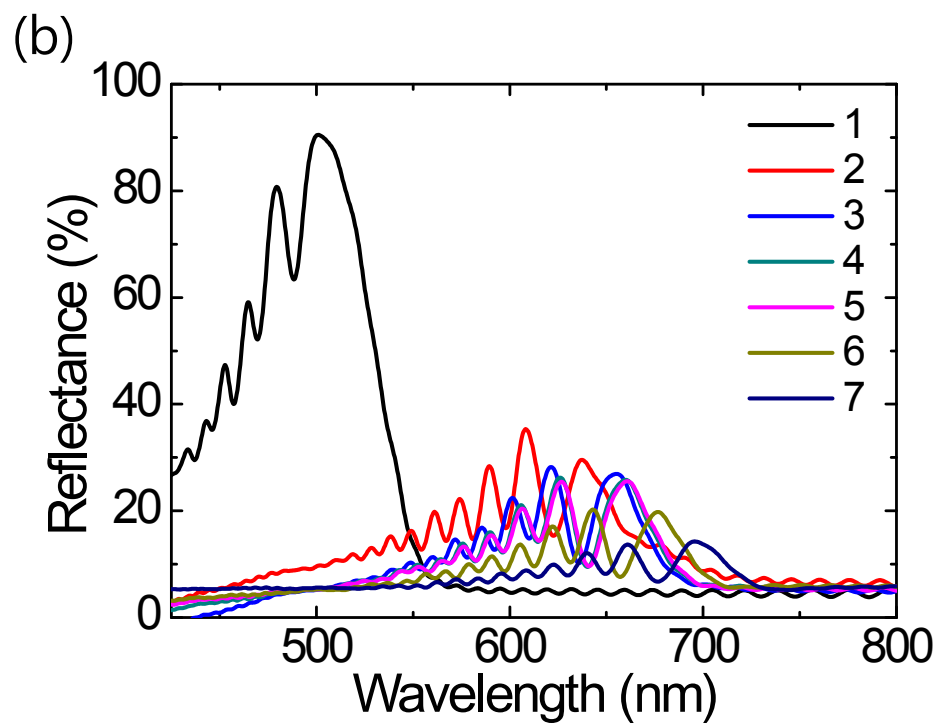


Figure S1 Reflectance spectra of the PCHs fabricated at (a) 14.5°C, (b) 15°C, and (c) 15.5°C, respectively.