**Supplementary Tables**

**Table S1** The relation between the dosage of reactants and SiO$_2$ diameters

| Number | Water (mL) | Anhydrous ethanol (mL) | Ammonia (mL) | TEOS (mL) | Average particle size of SiO$_2$ (nm) |
|--------|------------|------------------------|--------------|-----------|--------------------------------------|
| 1      | 24.75      | 61.75                  | 2.25         | 4.5       | 172                                  |
| 2      | 24.75      | 61.75                  | 4.5          | 4.5       | 450                                  |
| 3      | 24.75      | 61.75                  | 9.0          | 4.5       | 495                                  |
| 4      | 24.75      | 61.75                  | 13.5         | 4.5       | 551                                  |
| 5      | 24.75      | 61.75                  | 4.5          | 9.0       | 511                                  |
| 6      | 24.75      | 61.75                  | 4.5          | 13.5      | 612                                  |
| 7      | 24.75      | 61.75                  | 4.5          | 18        | 806                                  |

**Table S2** The comparison between the theoretic $\lambda_{\text{max}}$ and experimental $\lambda_{\text{max}}$ of PCs

| SiO$_2$ sizes (nm) | 232 | 281 | 304 | 323 | 356 |
|--------------------|-----|-----|-----|-----|-----|
| Theoretic $\lambda_{\text{max}}$ (nm) | 538 | 652 | 705 | 750 | 826 |
| Experimental $\lambda_{\text{max}}$ (nm) | 558 | 662 | 707 | 757 | 842 |
| Relative error | 3.58% | 1.51% | 0.28% | 0.92% | 1.90% |

**Supplementary Figures**
Fig. S1 (a) Diffraction spectrum of PCs; (b) The calibration curve between $\lambda_{\text{max}}$ of diffraction peak and particle size of SiO$_2$.

Figure S2. Effect of molar ratio of imprinted molecule, functional monomer and
crosslinker on optical diffraction of MIPC