Advanced Materials

SUPPORTING INFORMATION

Patterned Colloidal Photonic Domes and Balls Derived from Viscous Photocurable Suspensions**

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1. Contact angles

The ETPTA suspension spreads on glass substrate and forms droplets with the contact angle as 20°. However, Teflon coating increases the contact angle to 80°.

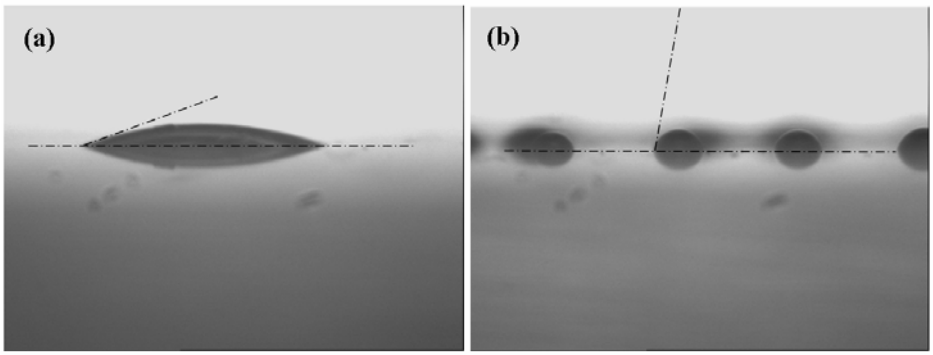

Figure S1. Optical microscope images of ETPTA suspension droplets deposited on (a) bare glass substrate and (b) Teflon-coated glass substrate. Contact angles were 20° and 80° for bare glass and Teflon-coated glass, respectively.

2. **Preparation of RGB hemisphere patterns with high coverage.**

As we increased the diameter of hemispheres with a fixed inter-hemisphere distance, we could prepare RGB color pattern with high coverage. Because our patterning method does not induce the volume shrinkage, which is typical of conventional evaporation-induced method, dense patterning is possible. This is a very promising feature for reflection mode display.

Within a hemisphere, silica particles rearrange to form the crystal phase. Usually, heterogeneous nucleation occurs at the interface and the silica particles form the hexagonal arrays on the entire surface. On the other hand, the central core of hemispheres shows relatively poor ordering than the interface region.

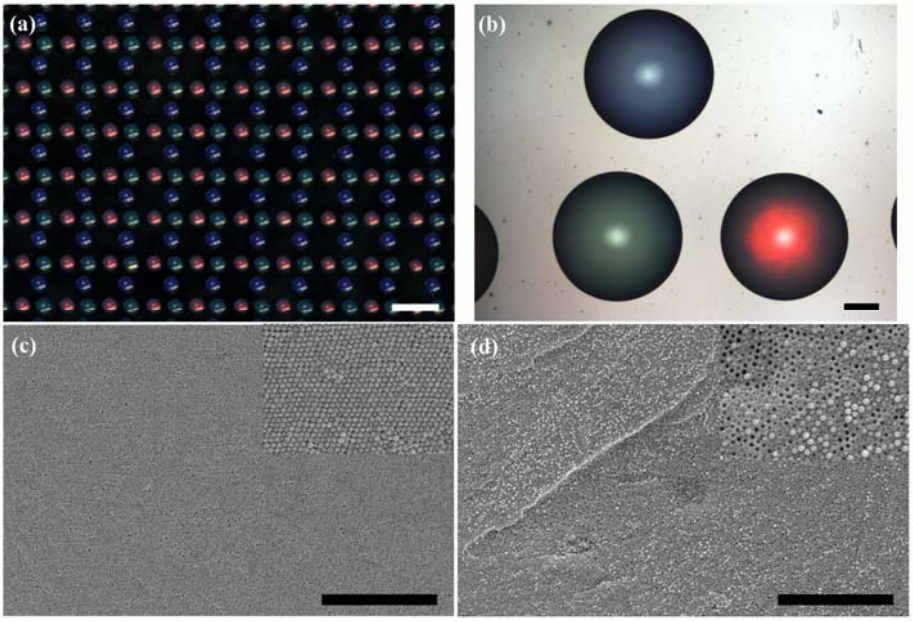

Figure S2. (a) Image of patterned RGB hemispheres of 375 μm (~ 10 nL) in average diameter. The separation distance between two nearest hemispheres with the same color is 1 mm. (b) Optical microscope image of a single RGB in triangular arrangement. SEM images for (c) the surface of hemisphere and (d) the central core of a fractured red hemisphere. Red, green and blue colored hemispheres are composed of 195 nm silica particles at $\phi = 0.33$, 150 nm silica particles at $\phi = 0.25$ and 145 nm silica particles at $\phi = 0.33$, respectively. The scale bars in (a), (b) and (c-d) are 1 mm, 100 μm and 10 μm, respectively.

3. Angle independence of reflection color

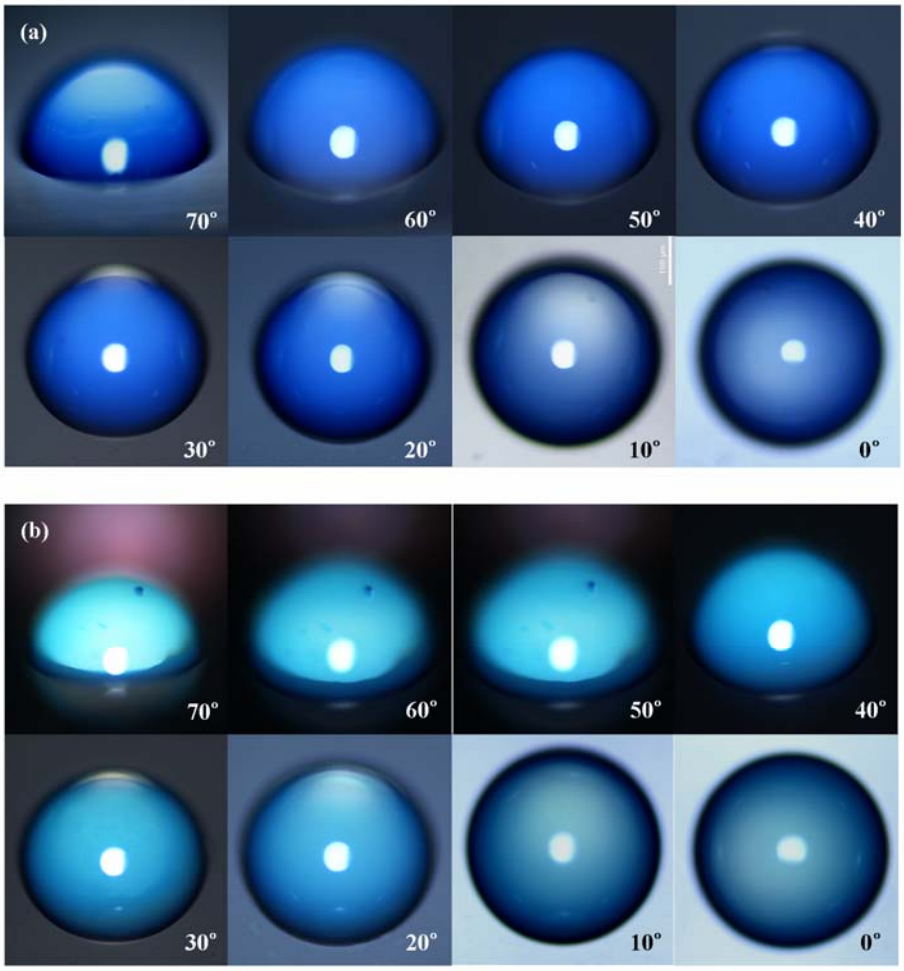

Figure S3. Optical microscope images of (a) blue and (b) green hemispheres taken at various viewing angles. The images showed the same colors independently of the viewing angle.

4. Preparation of RGB color patterns on PDMS substrate.

The silica-in-ETPTA suspension makes a contact angle of 50° on PDMS substrate and shows weak colors compared with one on Teflon-coated glass. However, the intensity of the reflected colors can be enhanced by selective removal of silica particles from ETPTA matrix.

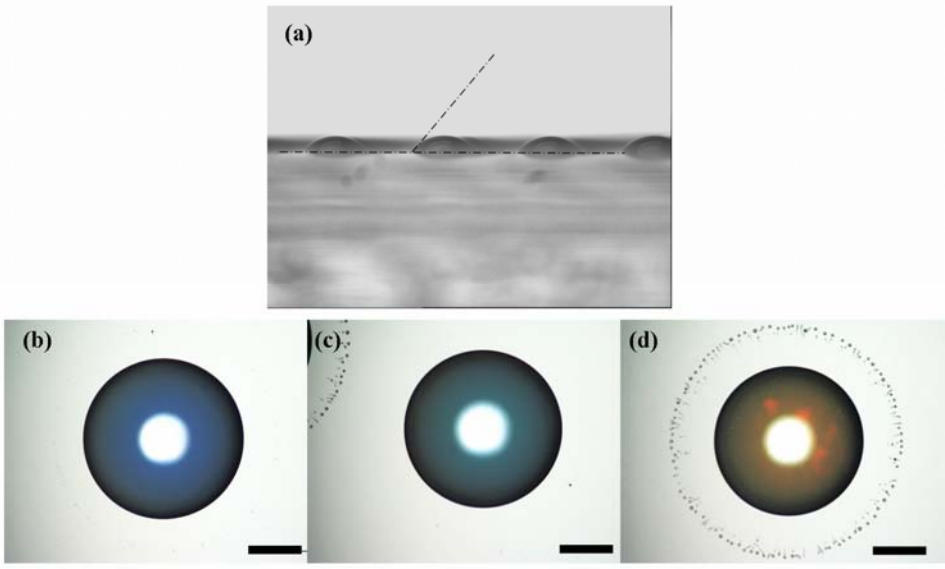

Figure S4. (a) Optical microscope images of silica-in-ETPTA suspension droplets deposited on PDMS substrate. The contact angle was 50°. Optical microscope images of (b) blue, (c) green and (d) red hemispheres before HF treatment. Blue, green and red hemispheres were composed of 145 nm silica particles at $\phi = 0.33$, 150 nm silica particles at $\phi = 0.25$ and 195 nm silica particles at $\phi = 0.33$, respectively. The scale bars in (b-d) are 100 μm.