A giant chiroptical effect enabled by a dielectric spiral nanoflower

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The chiroptical effect is the property of matter to selectively interact with light with opposite handedness, which is widely employed in stereochemistry, analytical chemistry, metamaterials, and spin photonics. Conventionally, metallic nanostructures have been utilized to produce strong chiroptical effects with the aid of surface plasmon resonance, but they suffer from large photothermal heat generation that severely restricts their applications. In this talk we present an all-dielectric spiral nanoflower, as shown in Fig. 1, with a giant chiroptical effect produced by inducing magnetic resonance. We show our theoretical prediction and experimental demonstration of the manipulation of the chiroptical effect of the nanoflower by tailoring its magnetic quadrupole interference. Our work overcomes the limitation of traditional metallic platforms and is expected to pave the way toward the development of various highly efficient and thermostable chiroptical devices and applications.

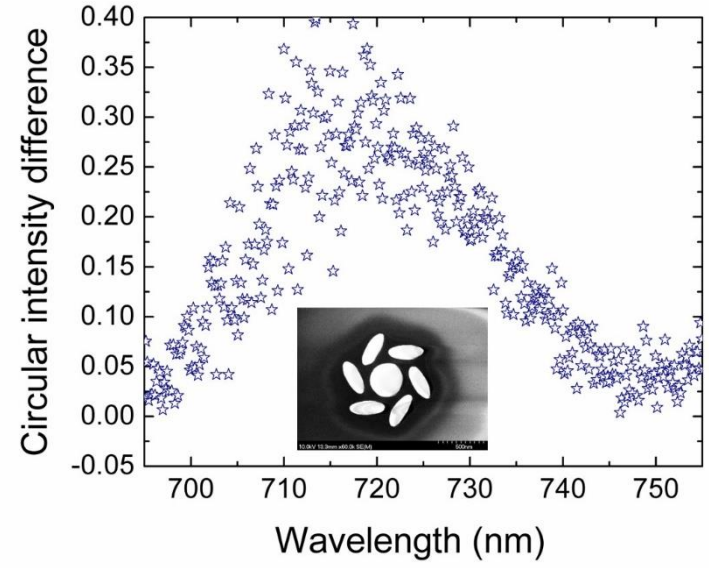

Fig. 1. Measured circular intensity difference of the fabricated dielectric nanoflower. The inset shows a scanning electron microscope image of the fabricated nanoflower.