

## Structural Coloration with Colloidal Crystals

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The regular arrays of colloids diffract a light with wavelength of bandgap and do not allow its propagation. This bandgap effect in visible range appears iridescent color, which never fades as long as the structure remains intact and is tunable by adjusting periodicity of the structure. To make such structural color in a practical manner, we have developed a facile method for the creation of colloidal photonic crystals with controlled shape and optical properties using photocurable colloidal suspensions. The repulsive colloidal particles dispersed in a liquid medium spontaneously form face-centered cubic lattices to minimize total interaction energy. This enables the fast crystallization without colloidal concentration. When photocurable resin is employed as a colloidal medium, a permanent fixation of crystal lattice can be achieved by rapid polymerization of the resin. By employing microfluidic and photolithography techniques, the colloidal crystals in a liquid state can be solidified and tailored to prepare colloidal photonic crystals with desired shape, size and optical properties, thereby providing a practical platform for structural coloration.