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拡散場における結晶のねじれ成長
Emergence of helical morphologies with crystals: twisted growth under diffusion-limited conditions

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Twisted crystals are widely observed in natural minerals and artificial materials. However, the formation mechanism for most of the helical morphologies is quite complicated and, thus, remains to be explained. Here, the twisted growth of inorganic and organic crystals under a diffusion-limited condition is described after detailed observation of the backbone structures and the chirality tuning of the helices. The helical structures were formed in a gel matrix with various inorganic and organic crystals having low crystallographic symmetry, such as triclinic, monoclinic and orthorhombic systems. The backbone was composed of a twisted stacking of tilted units regardless of the presence of molecular chirality. The particular morphologies depending on the stacking mode of the units were controlled by the gel density. The formation of the helices was attributed to the specific crystal growth under a mild diffusion-limited condition. The handedness of the helices was precisely tuned with specific interaction between the surface of the helical crystals and the chiral molecules in the matrix.