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## Stability Of Binary Colloidal Crystals Immersed In a Cholesteric Liquid Crystal

*Wednesday 9 June 2021 16:15 (3 minutes)*

We model a number of both closed-packed and non-closed-packed crystals inside a cholesteric liquid crystal (LC) with different pitch values and nematic LC through the Landau-de Gennes free-energy method[1]. We investigated the anisotropic interactions between particles with heterogeneous boundary conditions inside both nematic and cholesteric liquid crystals[2]. The results show that it is energetically favorable for the particles to remain in a plane parallel to the far-field director in a nematic liquid crystal, while for particles immersed in a cholesteric there are multiple energy minima not all located in the same plane. Therefore, We became interested in investigating the stability of binary crystals [3]. The results indicate that body-centered-cubic (BCC) crystals have a lower-energy lattice defect structure than the diamond crystal. Furthermore, it is shown that a pair of binary colloids can be self-assemble into a stable face-centered- cubic lattice structure inside a nematic LC, as it has the lowest energy comparing to diamond and BCC crystals.

1-P.G. de Gennes and J. Prost, *The Physics of Liquid Crystals* (Oxford University Press, Oxford, 1993)

2-Phys. Rev. E 95, 052703 –Published 30 May 2017

3-Phys. Rev. E 99, 052701 –Published 13 May 2019

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