Comment of »Theory of the Formation of Colloidal Crystals« by Mirnik

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Recently Mirnik discussed colloidal crystals\(^1\) on the basis of our experimental findings.\(^2\) He claimed that the hexagonal structure of one particle surrounded by six others is in reality impossible and what we observed is a not true apparent hexagonal packing. His argument was based on a simple cubic lattice (See Figure 2 in Ref. 1.), which he incorrectly presumed to exist in colloidal dispersions. It should be pointed out that a simple cubic lattice structure has never been observed for colloidal systems. Our micrographic study,\(^3\) X-ray scattering\(^4\) and Kossel line analyses\(^5\) have established that the crystals belong to a face-centered-cubic (fcc) or body-centered cubic (bcc) symmetry, depending on the latex concentration. The (111) plane of an fcc structure provides a strictly hexagonal arrangement while the (110) plane of a bcc symmetry shows a slightly deformed hexagonal packing. Thus, his claim that \(2D_{\text{pp}}\) is apparent interparticle distance is unwarranted, particularly for the fcc symmetry, it is actually the center-to-center distance between particles.

REFERENCES

5. See, for example, I. S. Sogami and T. Yoshiyama, Phase Transitions 21 (1990) 171. Earlier relevant literature is given in the article.