

The optics of a possible new interference figure in mineralogy

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ABSTRACT

For eight decades, the number of interference figures in optical mineralogy has remained constant: three figures for uniaxial minerals and seven for biaxial ones. Each figure has its own specificities and formation conditions. However, the grossular garnets of the Quixeramobim region in Brazil exhibit a possible new type of interference figure: the “mosaic.” This rare characteristic is present in seven samples of grossular garnet from the region. In this paper, we explain how this new interference figure, named “mosaic,” is formed using optical mineralogy principles. When viewed with the quartz-gypsum accessory plate, these samples show an agglutination of colors, with blue, yellow, and purple appearing together in a mosaic configuration. This figure is formed by the different directions of vibration of light as it passes through these anisotropic garnets. Thus, in this configuration, the optic axes and acute and obtuse bisectrix occur in such a way that they are at the same time inclined ($//$) and perpendicular (\perp) manners. So far, the interference “mosaic” has been observed only in garnets of the grossular group; it occurs only in minerals that require a high degree of optical disorder.

Keywords: Optical mineralogy, biaxial, grossular garnet