

Holography in Mineralogy

LI, SHENGRONG, China University of Geosciences, Beijing, China

Holography is applied to summarize such phenomena as that the characteristics of a part of a thing reflect the characteristics of the whole thing both spatially and temporally. In mineralogy these phenomena are often observed. The characteristics of a mineral can reflect those of the related mineral association. The ontogeny (individual development) of a mineral can reflect the phylogeny (systematic development) of the mineral. The holography in mineralogy can be taken as a strong tool in the forecasting of mineral association and systematic development by few mineral studies. It is of great significance both in theoretical studies of mineralogy and environmental and economic geology.

One holographic case is noticed in the development of quartz in Rushan gold deposits. The zoning of quartz at main mineralization stage reflects the ontogeny of individual crystal, and the evolution of quartz at different mineralization stages is the phylogeny of quartz in mineralization period. It is found that the variations of 11 parameters of quartz are highly consistent not only in the ontogeny with the phylogeny of quartz, but also in different periods (such as the early and late periods), and even different growing stages (such as different zones) of an individual crystal. It should be highlighted that the reappearance of phylogeny in ontogeny is the reappearance of the variation trend, and that ontogeny is the inspissation of phylogeny. That the fineness of gold mineral reflects approximately the gold tenor of the ore is another example of holography often observed.