Crystal Size Distribution of kyanite and staurolite from Hamza Qassim and Khazai Bala Metapelites-southeast Shahin-Dezh; confirmation to regional metamorphism conditions at the area

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Abstract: The crystal size distribution (CSD) of kyanite and staurolite from the Hamza Qassim and Khazai Bala metapelites has been studied. All samples show linear CSD pattern for kyanite and nonlinear concave down (with two distinct parts) for staurolite. The linear CSD for kyanite defines high growth rate and equal granular crystals. Two segmental patterns for staurolites can show that they have formed as a result of two possibilities, first is differences on reactions which form the mineral and second is differences on responsible regional metamorphic phase. Although the first case has more evidences. The Gt and nucleation rate (J) for kyanites were 0.931 and -1.6 mm⁻⁴. For staurolites the fine and coarse grain parts population density was 5.25 mm⁻⁴ and 6.1 mm⁻⁴. Average growth rate at time (Gt) calculated values for fine and coarse staurolite crystals were 0.405mm.t and 0.763mm.t. Detail studies show that nucleation rate ratios for staurolite was 5.5 times more than kyanites, but kyanite crystals were about 2 times coarser than staurolites.

Keywords: Crystal size distribution (CSD); kyanite; staurolite; nucleation rate; growth rate; Shahin-Dezh.

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