Clustering textures of crystals in igneous rocks and their origins studied by experiments

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There exist various types of clustering textures in natural igneous rocks. Glomeroporphyritic texture in volcanic rocks and crystal clusters in plutonic rocks (e.g. granite) are their examples. Based on the experimental results using diopside - anorthite binary system, the authors propose the mechanism of textural development that produces various types of clustering textures. In cooling process, the solid-melt interfacial energy (dihedral angle at solid-melt-solid triple junctions) increases with decreasing temperature, and crystal clustering occurs when the dihedral angle exceeds around 60 degree. The combination of the crystal clustering and the sequence of crystallization will produces variation of textures, that is, clustered or non-clustered, and types of clustering.