Crystal clustering and melt separation with increase of solid-melt dihedral angle

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In cooling experiments with a partially molten material belonging to diopside - anorthite system, where diopside and melt coexisted, the dihedral angles at solid-solid-melt triple junctions increased with decreasing temperature, and both crystal clustering and melt segregation occurred when the dihedral angle exceeded around 60 degree. This phenomenon is considered to be a textural change to reduce total interfacial energy (i.e. textural equilibrium); however, the phenomenon was not clearly observed in the isothermal experiments at the temperatures where the dihedral angle was large enough. These results will be a key to the solutions of the origin of clustered textures in igneous rocks and the mechanism of melt segregation in natural partially molten systems.