

Abstract

Poikilitic texture has been studied for over six decades and has been observed in both small and large mafic intrusions. Centimeter-sized oikocrysts and the smaller chadacrysts contained within them are the result of supercooling in the magma chamber and its early stage of crystallization. Consequently, based on the study of poikilitic textures, we can gain information about the supercooling history and parental magma composition, try to reconstruct the conditions of crystallization, and enhance our understanding of magma chamber dynamics.

To understand the formation of poikilitic textures, optical and quantitative textural analysis was performed. Selected samples of poikilitic gabbros from the Kdyně Massif were examined for the modal amount, the value of the clustering index, the crystal size distribution, and zoning within the oikocrysts. Studied textures within the oikocrysts show similar features to that within the groundmass. However, the crystallization volume is 20-25 % greater in the groundmass, indicating a longer crystallization period and both textures approach a random texture trend in the crystallinity vs. clustering index space. The CSD curves are mostly log-linear and parallel. The presence of limited textural coarsening is marked.

The evolution of chadacrysts is part of understanding the nucleation and growth rates. The KD6_2 sample shows a doubling in grain size from the oikocryst centre to its rims. This indicates a decrease in the degree of supercooling from the centre of the oikocryst to the rims. No significant size gradation within other oikocrysts is recorded, with this exception. This work provides a record of in-situ crystallization affecting poikilitic gabbro from the Kdyně Massif.