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Achtarandite – sponge hibschite pseudomorph after wadalite-like phase: internal morphology and mechanism of formation

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With 4 figures

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Abstract: Achtarandite, tetrahedral pseudomorph after a wadalite-like mineral, is represented by different types of pseudomorphs on the Wiluy deposit.

As a result of processes and mechanisms of pseudomorphic substitution of wadalite (protoachtarandite) by hydrogarnet are white, predominantly hibschite pseudomorphs. Crystal chemical affinity of the protophase (wadalite) and metaphase (hibschite) and morphological particularities of achtarandite allowed to classify these pseudomorphs as the sponge pseudomorphs formed in the systems with isomorphic components. Peculiarities of the internal morphology, character of morphology and composition evolution of hydrogarnet from achtarandite pseudomorphs: {111} hibschite → {110} Fe–hibschite → {211} Ti–hydroandradite (GALUSKINA et al. 2001), allowed to distinguish successive formation stages of the sponge pseudomorphs and to determine mechanisms of structure formation corresponding to these stages. Sponge structure of pseudomorphs was forced by the substitution mechanisms (mechanisms of the simultaneous growth and dissolution) at the conditions of volume deficit of new-formed phase.

Key words: Achtarandite, sponge pseudomorph, hibschite, morphology, mechanism of substitution, epitaxy, Wiluy, Russia.

Introduction

Knowledge of the mechanisms and conditions of pseudomorph formation is essential for the interpretation of natural metasomatic processes. Very porous (spongy), white hibschite pseudomorphs of achtarandite from the rodingite-like rocks of the Wiluy deposit, Republic Sakha-Yakutia (LYACHOVICH 1954, GALUSKIN et al. 1995) serve as a good natural model for the study of pseudomorph formation. These pseudomorphs are characterised by a well-preserved

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