# MODELING METHOD FOR OBTAINING KINETIC PARAMETERS OF DIFFUSION-CONTROLLED METAMORPHIC REACTIONS

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A new method to derive kinetic parameters of diffusion-controlled metamorphic reactions was elaborated. This method is based on the comparison of the model of a temperature field evolution nearby a cylindrical intrusion and observable chemical changes in biotite at the contact aureole of the Kharlovo massif. The analytical expressions presented can in principle be used in determining the relationship between time, temperature and mineral composition changes for a wide range of contact metamorphic reactions. Contrary to other methods used to construct a quantitative model of reactions which form distinctly expressed zoned microtextures, the proposed approach allows better understanding of the processes proceeding in texture-homogeneous rocks, where the complete consumption of some reactant mineral phases does not allow the chemical reaction to be reconstructed quite accurately. The numerical calculations yielded estimates of the effective rate of metamorphic reactions [ 10.e(-12)/ sec)] and effective diffusion coefficient [(5.29*10.e(-16) cm**2/sec] using the scales of mass-transfer involved in metamorphic reactions with biotite's participation. These values are consistent with experimentally and theoretically derived results in or near relevant temperature range of solid-state diffusion, including grain-boundary diffusion.