AN APPLICATION OF GEOTHERMOBAROMETRY FOR RESTORATION OF PALEOTHERMAL EVOLUTION OF METAMORPHIC COMPLEXES.

FED'KIN V. V.

Korzhinskii's method of physicochemical analysis of mineral assemblages and the principle of local mineral equilibrium were applied to several metamorphic complexes from different geodynamic fragments of the Earth's crust. Intensive microprobe analyses of mineral compositions, their zoning and mineral inclusions made it possible to restore the physicochemical conditions of metamorphism and establish the position of the geothermal gradient line in P-T-time terms. Precambrian shields are characterized by relatively high-grade geothermal gradient with core-to-rim P-T trends extending from 800-850^{o}C/7-8 kbar to 500-600^{o}C/3-4kbar (Aldan and Ukrainian shields). The prograde and retrograde trends in the range from 450-550^{o}C and 3-5 kbar to 600-700^{o}C and 8-10kbar are typical for the fold-belt fragments of continental crust (Batocina complex, Serbia; Borshit Series, North Pamir; etc.). The eclogite-glaucophane-schist belts related to the interactive zones of continental crust show the clockwise P-T trends in the range from 300oC/8-9kbar to 600-650^{o}C/13-14kbar (in some case up to 900^{o}C/18-19kbar) and back to 500-550^{o}C/3-4kbar (Atbashi Complex, South Tien-Shan). The most high-grade geothermal gradient was found in the Bistrica ultramafic block, which occurs within the Dinaridic Ophiolite Belt Terrane (Serbia) at the conjugation zone of the oceanic and continental crust. The ultramafic rocks of this complex are characterized by both prograde and retrograde P-T trends, with the peak metamorphic parameters ranging from 850^{o}C/8-9kbar to 600^{o}C/3kbar. This study was supported by the Russian Foundation for Basic Research, grant No. 98-05-64002.