

MASS TRANSFER DURING THE METAMORPHISM OF THE SERIDÓ SCHIST, NORTHEASTERN BRAZIL

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The Seridó Schist within the Borborema Province, northeastern Brazil, consists of a highly deformed sequence of Neoproterozoic aluminous metapelites. During the metamorphism of this sequence the following metamorphic zones were developed: (1) garnet zone representing the regional metamorphic event; and (2) cordierite - andaluzite and sillimanite - muscovite zones, which mark a metamorphic-hydrothermal event. The cordierite-andaluzite zone formed at the expense of the garnet zone, whereas the sillimanite - muscovite zone evolved through metassomatic reactions within the garnet and cordierite - andaluzite zones, with the significant participation of an external fluid phase, driven by the voluminous quantity of igneous intrusions, which took place during the Brazilian/Pan-African event (~600 Ma). A systematic mass balance study indicated that during the breakdown of the garnet zone to the cordierite-andaluzite zone Ca, Na, K, Rb and Sr were lost, whereas Cu, Li and B were introduced into the system. In the development of the sillimanite-muscovite zone, the mass transport depended upon the nature of the protolith: fluid-rock reactions in the cordierite-andaluzite zone resulted in the addition of Ca, Na, K, Sr and Rb, accompanied by the loss of Cu and Li (B was immobile); in the case of the garnet zone as protolith, Ca, K, Cu and B were introduced, whereas Na depleted (Sr, Rb and Li were immobile). Al, Ti, Fe, Mg, Mn, P, Nb, Y, Zn, Ni and Zr were immobile during the whole metamorphic - hydrothermal process. Si and Ba apparently underwent lateral mobility during the formation of a single zone.