P-T CONDITIONS OF THE METAMORPHIC ROCKS OF THE SILGARA FORMATION, SANTANDER MASSIF, COLOMBIAN ANDES

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The Silgara Formation of the Lower Palaeozoic, exposed in the Pescadero-Aratoca area, southwestern Santander Massif, consists of metapelitic rocks and interlayered metabasic rocks with Triassic-Jurassic calc-alkaline granites. The regional metamorphic grade of the Silgara Formation decreases southwestward from sillimanite-zone through staurolite-zone and garnet-zone up to biotite-zone. Metamorphism has occurred under conditions of high-temperature and low-pressure, and reflects the high heat flow that exists in this part of the Santander Massif. Garnet crystals show chemical zoning, which is typical for prograde metamorphism, with decreasing of Mn and increasing of Fe and Mg from core to rim. Ca increases outwards and reaches maximum at mantle. Ca content in garnet probably depends on metamorphic pressure. P-T conditions estimated from the garnet, staurolite and sillimanite zones, using thermometers and barometers are in the range of 450-650°C and 2.0-4.0 kbar.In conjunction with petrographical and structural evidence, we conclude that the Silgara Formation shows evidence of a polymetamorphic evolution characterized by (1) very small crustal thickening during nearly isobaric heating and (2) regional retrograde metamorphism after peak of metamorphic temperature.