Nanogranites in anatectic metapelites: building up the database

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Nanogranites are inclusions of former anatectic melt trapped within peritectic minerals, particularly garnet, and crystallized to a cryptocrystalline aggregate of quartz, feldspars and micas. After their recent discovery[1] in the khondalites of the KKB (India), nanogranites have been found in numerous localities worldwide and, with their appropriate characterization and analysis can provide the missing information on the composition of natural anatectic melts before they undergo modification processes. We report the main results of the study of *nanogranites* in the Ronda migmatites, and preliminary results from migmatites in the Ivrea Zone (Italy) and Kaligandaki (Himalaya). Successful experimental rehomogenization of the inclusions to a glass allows the analysis of major elements and H_2O contents of the natural anatectic melts. Despite being all leucogranitic, the compositions generally plot away from those of *minimum melts*. Systematic differences occur among samples, particularly concerning Qtz-Ab-Or relationships. The analysis of H2O in the rehomogenized inclusions demonstrates that nanogranites preserve the primary fluid contents and that melts produced at Ronda were mainly H_2O-undersaturated even at low degree of melting. Since H_2O is one of the main parameters determining melt viscosities and, in turn, the strength of partially melted rocks, the characterization of the fluid contents of *nanogranites* will allow more realistic constraints to the rheological behaviour of the deep crust, and to the timescales of melt extraction from it.

[1] Cesare *et al.* (2009) *Geology*, **37**, 627-630.

C and Sr-isotope Stratigraphy, Ce and Eu Anomalies in Neoproterozoic Carbonates the Serra do Paraíso (Rio Pardo Basin) and São Desiderio (Rio Preto Belt) formations, Bahia, Brazil

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Introduction. The Rio Pardo Basin and Rio Preto Belt surround, respectively, the southeastern and northwestern portions of the São Francisco Craton, eastern Brazil. We examined the possibility that carbonates of the Serra do Paraíso Formation (Rio Pardo Basin) that overly diamictite/arkose of Panelinha Formation or basement, and those of the São Desiderio Formation (Rio Preto Belt) that covers the Canabravinha Formation, represent Neoproterozoic cap carbonates.

In the Serra do Paraíso Formation, the $\delta^{13}C$ values for carbonates with stromatolites at Serra do Paraíso Farm are ~ -5‰ and upsection values jump to around +9‰ towards the top of this formation.

In the Rio Preto Belt, representative sections of São Desiderio Formation have the following $\delta^{13}C$ values: at the Mineração do Oeste Quarry, limestones show $\delta^{13}C$ values from +1.2 to +2.2‰ in the first 16m changing abruptly upsection to values between +10 and +12‰ in organic matter-rich limestones. At Sítio Rio Grande, limestones show values from +13.5 to +15‰ in the first 30m, and from +14 to +16‰ upsection, in organic matter-rich limestones.

Carbonates from Serra do Paraíso Formation display negative Ce anomaly values in the base of the formation and positive values upsection, as an indication that the depoitional environment passed from anoxic into oxic conditions. Their positive Eu anomalies roby resulted from influence of hot exhalation of hydrothermal fluids. Carbonates from the São Desidério Formation exhibit just positive Ce anomaly values, indicating an anoxic environment, and display negative Eu anomaly values that suggest reducer environment.

Hg values have been used as a proxy of volcanism intensity and CO_2 buildup during Snowball Earth events. Hg contents in cap carbonates are usually over 10 times higher than background values (<1 $ng.g^{-1}$) [1], in Serra do Paraíso Formation Hg values is 0.92 in the base changing upsection to 10.64$ng.g^{-1}$.suporting the idea of mantle-origin for the CO_2 in cap carbonates, transferred to the atmosphere by volcanism.The values of $^{87}Sr/^{86}Sr$ for carbonates of both formations vary from 0.707584 to 0.708061, compatible with a depositional age bracketing the end of Cryogenian (Marinoan) glaciation.

Conclusions. Our current data set is compatible with the hypothesis that Serra do Paraíso and São Desidério formations represent two cap carbonates.

[1] Sial *et al.* (2010) Precambrian Research **182**, 351-372.