

Syn-deformational anatexis along the Santa Rosa river section, Argentina: Feedback relations between deformation, metamorphism and melt extraction

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Mass transference from lower to upper crustal levels requires an efficient network of pathways that act as channels for draining melts from the source and transferring magmas through the crust. We report on a mid-crustal section in the Santa Rosa river from the Eastern Pampean Ranges that underwent partial melting under active deformation. The study focuses on the feedback relations between structural features and the position and shape of leucosomes that record the remnant magma network in both metasedimentary and meta-igneous rocks. A complete range of migmatites encompassing from patch to stromatic metatexite to schollen-schlieren and nebulitic diatexite formed during a single high-grade metamorphic event that postdated a previous sub-solid evolution. The diversity in migmatites structures suggests that the layered sequence behaved heterogeneously under a non-coaxial deformational regime of progressive deformation. The relationships between migmatitic structures and the progressive production of melts resulted in feedback relations that persisted as a time-marker during the Pampean event. U-Pb dating of leucogranitic zircons allows constraining the time of melt generation and segregation to the lower Cambrian (534-520 Ma). Migmatites in the lower crust of the Pampean orogen acted as channels of melt migration towards

upper crustal levels.