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Syntectonic carbonate cementation in veins. Evidences from the Cenozoic sedimentary successions drilled at Cape Roberts, Victoria Land Basin, Antarctica

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Carbonates in veins from the Cenozoic sediments drilled at Cape Roberts were investigated in order to clarify a possible tectonic control on sedimentation and cementation.

Most of the carbonate infills is calcite showing different cementation patterns related to a large variety of textures, crystal shape, crystal size and mineralogy.

Four different calcite microfabrics were identified: microsparite-sparite, drusy, elongated, fibrous calcite.

Microsparite-sparite occurs as infills in most veins. Under CL, calcite crystals have a uniform brightness suggesting a homogeneous composition. Drusy calcite commonly fills small cavities, often associated with sparite and/or elongated crystals. Elongated calcite is also common as vein infills formed either by wide (up to 50 μm) fibers growing from the vein wall toward the vein center, often associated with sparite/drusy sparite, or by straight fibers growing across the vein (no median line). Fibrous calcite consisting of micrometric acicular crystals were recorded only in a few veins. Under CL calcite fibers show irregular crystal boundaries and different brightness (bright to dull) maybe due to solid inclusions.

On the basis of thin section observations, different types of vein microstructures were recognized among the end members illustrated by Passchier and Trouw (1996). Moreover, data on main fabric, mineralogy permitted to discriminate different paragenesis of the vein infillings and to clarify the possible tectonic control on cementation.

Paragenesis 1: single stage of calcite precipitation consisting of microsparite as infills of micrometric veins (hairlines) or sparite occuring as equant crystals as infills of centimetric veins due to no tectonic control.

Paragenesis 2: A first stage of microsparite and/or sparite precipitation followed by syntectonic fibrous calcite related to partial tectonic control.

Paragenesis 3: A first stage of microsparite and/or sparite precipitation followed by a second stage of syntectonic elongated crystals and then formation of drusy calcite documenting an active tectonic control.