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Progade PT path, prograde fluid flow, metasomatism and hydrous melting in the Osor high-grade HT-LP complex (Catalan Coastal Ranges-CCR, NE Iberia).

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Fast thermal pulses related to HT-LP metamorphism may imply dehydration reaction overstepping, higher than normal fluid production rates, quick local increases in Pfluid and common situations of Pfluid » Plitostatic and surpassing locally the tensile stresses. This ambient would be favorable to transient hydrofracturing and fluid flow even if the ongoing HT-LP event develops on dominantly ductile crustal levels. In inner zones where temperatures are high enough, hydrous melting and melt migration would be favored as well. Such movement of fluids and melts would tend to be sustained if non-hydrostatic stresses are active during heating, and would be favored in high strain domains such high-T shear zones or along foliation planes. In such scenario, local metasomatic processes and mass-transfer phenomena are expected to occur along these high strain zones and so distributed along tectonic anisotropies.
A variety of features found in high T Garnet - biotite-sillimanite±cordierite±plagioclase±K-feldspar±quartz metapelitic gneisses from the Osor Complex (Guilleries massif, CCR), testify from this kind of processes operating in the lower crustal section, at the amphibolite to granulite transition zone during a prograde Variscan HT-LP thermal pulse. Such features include: syn-D2 quartz veining, leucogranitoid (leucotonalite, trondhjemitic) lenses sub parallel to S2 dominant foliation, fibrolite-rich foliation planes and prograde sub-idiomorphic garnet developing preferentially near fluid migration channels (quartz veins) or near melt lenses.