

The Structural Setting and Relative Timing of the Bergby LCT-Pegmatite Field, Central Sweden

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The Bergby LCT-pegmatite field is the latest discovered LCT-pegmatite field in Sweden and the Fennoscandian Shield and the most promising Li project in the country. It covers an area of c. 50 km² and is located in the west-central part of the Paleoproterozoic Svecokarelian orogen. Here we suggest a temporal link between the emplacement of the LCT-pegmatites and late-orogenic shear activity.

The host rock to the LCT-pegmatites is a refolded metasupracrustal syncline with a thrust contact to the surrounding c. 1.85 Ga granitic gneisses. The metasupracrustal sequence comprises mica schists succeeded by 1.89 Ga metavolcanic rocks with compositions ranging from rhyolitic to basaltic that are discordantly overlain by quartzites originating from <1.85 Ga clastic sediments. Regional metamorphism affecting the metasupracrustal rocks reached low-P amphibolite facies with an increase in temperature from the andalusite stability field in the east to sillimanite in the western part of the area, where barren granitic pegmatites are ubiquitous. Peak metamorphism at 1.83 Ga was accompanied by ductile deformation characterised by westward-verging overturned F1-folds and thrusts. Changes in convergence direction refolded the older structures to a large-scale, easterly-dipping, reclined F2-synform. Strain partitioning resulted in kilometre-wide, steep 1.81 Ga shear zones arrested at the limbs of this fold.

The known LCT-pegmatites are found in the most competent rocks in the area, represented by amphibolites, the quartzite, and the high-strain zones. They strike in the same direction as the main foliation, but in the F2 hinge zone they dip to the west; i.e., in the opposite direction to the foliation. In the shear zones, the LCT-pegmatites are steep and variably affected by deformation such as boudinage and shear folding. Occasionally they display an internal ductile strain. The suggested temporal link between the LCT-pegmatites and the shear activity implies that they were formed and emplaced at 1.81 Ga.