Textural and Mineralogical Characterization of One Lithium Deposit from the Barroso-Alvão Aplite-Pegmatite Field: Preliminary Study

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The AL56 deposit is located in the Barroso-Alvão aplite-pegmatite field in the north of Portugal and has outcrops along an area of approximately 500 × 300 meters. The western side of the area has several small bodies (4–5 meters wide) of aplite-pegmatites where lithium is majorly in the form of spodumene and/or petalite. The bodies tend to be N130° dipping 30° to 50° to the NE. They also have a preferred type of zonation from top to bottom: 1) up to 0.5cm of border zone; 2) up to 10 cm of a pegmatitic zone constituted by quartz and feldspar (crystals up to 2 cm) and occasionally white mica; 3) aplite-pegmatite alternations with thickness typically varying from 4 to 10 cm each; 4) Li-mineralization in the shape of fine spodumene and/or petalite in the center of the body; 5) last meter without Li-mineralization that can either be a layered aplite or pegmatite with megacrystals of feldspar (up to 10 cm).

In the area of the AL56 deposit, Li-mineralization occurrence and distribution seem to be related to deformation, which was still active during the crystallization of these bodies. Zones with spodumene > petalite seem to be aligned with zones of greater stress. It is possible that while the aplite-pegmatites were cooling and entering the zone of stability of spodumene, zones with greater stress led to the dissolution of petalite and precipitation of fine spodumene and quartz around other minerals in zones of lesser stress. The zones of lower stress can correspond to the zones where petalite can still be observed or to the zones where the breakdown to spodumene and quartz occurred, preserving in a great extent the outer shape of the petalite crystals.

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