TABLE 1. COMPOSITION AND UNIT-CELL DIMENSIONS OF SPODUMENE AND PETALITE FROM FORMIGOSO (A), PICOTO DO CARVALHO (C), AND VERDES - FOLGADOIRO (D)*

	SPODUMENE, D	PETALITE, A
SiO_2 wt.%	64.22	75.88
Al_2O_3	26.59	17.80
Fe_2O_3	0.09	0.03
MnO	0.04	0.01
MgO	0.02	0.01
CaO	0.07	<0.01
Na_2O	0.15	0.10
K_2O	0.03	<0.01
TiO_2	<0.01	<0.01
P_2O_5	0.23	0.09
Li_2O	6.71	4.62
LOI	1.32	1.62
total	99.47	99.90
Si	2.03	3.94
^{VI}Al		0.06
^{IV}Al	0.99	1.02
Li	0.86	0.97
Na	0.01	0.004
Fe		0.001

	SPODUMENE, C	SPODUMENE, D	PETALITE, A
a (Å)	9.463(1)	9.467(3)	11.746(7)
b (Å)	8.398(1)	8.390(2)	5.137(2)
c (Å)	5.221(1)	5.221(2)	7.624(2)
β (°)	110.193(15)	110.183(32)	112.940(30)
V (Å^3)	389.41(09)	389.20(16)	423.64(20)

* Sample locations can be found on Figure 2. Further details are provided in Gomes & Nunes (1990, Table 4).

(1992), cassiterite ± columbite–tantalite or zinnwaldite ± amblygonite ± topaz are found. We consider the Gelfa occurrence to be a part of a more extensive field of aplite and pegmatite bodies covering the entire coast north of Viana do Castelo.

The presence of a symplectitic intergrowth of spodumene with quartz in shear zones in the Serra do Barroso occurrence was noted by Charoy *et al.* (1992). Gomes & Nunes (1990) attributed the symplectitic intergrowth to the pseudomorphic (isochemical) replacement of petalite. We considered the almost complete transformations of petalite in shear zones to the east of Serra de Arga to be a possible result of a path of increasing pressure resulting from shearing in the P–T grid proposed by London (1984).

Finally, in our opinion, a proper evaluation of the mineral potential of the pegmatite fields in the Hercynian province of northern Portugal cannot neglect the highly evolved residual melts associated with the Arga granite (Gomes & Nunes 1990, Gomes 1992). The modal proportion of petalite attains 15 vol. % in some bodies in the Formigoso area (Fig. 2). Some bodies of homogeneous aplite and pegmatite approach 8,000 ppm Li, and contain disseminated spodumene and petalite. Lepidolite-bearing pegmatites in the same field may exceed 12,000 ppm Li.

THE CRYSTAL CHEMISTRY OF SPODUMENE IN SOME GRANITIC APLITE–PEGMATITE BODIES OF NORTHERN PORTUGAL: A COMPARATIVE REVIEW: REPLY

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It is unfortunate that at the time our paper was submitted to this journal, early in 1991, we were unaware of the paper of Gomes and Nunes which, though attributed a date of 1990, actually appeared late in 1991. In our paper, we did include all relevant references available to us, including the paper of Torre de Assunção (1954) concerning the Gelfa area. We based our sampling in that area on that investigator's description of spodumene in aplitic veins that cross-cut strongly foliated two-mica granite, in order to obtain suitable samples for a comparison of the crystal chemistry of such spodumene with that from other occurrences and environments. It was not our intention to embark upon a detailed regional study, and we focused instead on the aplite–pegmatite bodies of the Barroso area, where one of us (FN) has been engaged in collaborative studies with DGGM (Geological Survey of Portugal) for several years.

We accept that symplectitic intergrowths of spodumene + quartz have been classically interpreted as a result of the breakdown of petalite. In our opinion, however, such a reaction is unlikely in the Barroso area. The sheaf-like aggregates of spodumene + quartz are evidently in equilibrium with the stable fragments of spodumene they enclose (Charoy *et al.* 1992, Fig. 4b), and cannot be produced by breakdown of early petalite. Such an assumption would constrain a very unlikely path of P–T evolution in the diagram of London (1984).

We are happy to note the interesting associations of Li-bearing minerals documented by Gomes & Nunes (1990). It seems obvious that the Hercynian Province of northwestern Portugal holds much potential for Li and Sn mineralization, the exploration of which will be incumbent on the staff of DGGM.

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