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GEOCHEMISTRY OF GRANITOIDS FROM CASTELO BRANCO, CENTRAL PORTUGAL

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The Castelo Branco pluton consists of late- to post-tectonic Hercynian granitoid rocks that intruded a Cambrian schist-metagraywacke complex. The muscovite-biotite monzogranite G1 is surrounded by the medium- to fine-grained biotite-muscovite granodiorite G2, which is surrounded by a medium- to coarse-grained biotite-muscovite granodiorite G3, grading laterally to a muscovite-biotite monzogranite G4, which is partially surrounded by a muscovite-biotite granite G5. The granitoids contain quartz, microcline,

albite-oligoclase, Fe^{2+} -biotite, chlorite, muscovite, tourmaline, apatite, zircon, rutile, ilmenite and monazite. G3 and G4 also contain andaluzite. Microcline phenocrysts were found in all granitoids, but G3 and G4 also contain albite-oligoclase phenocrysts. All granitoids are peraluminous with A/CNK ratios

ranging from 1.10 to 1.19. Normative corundum is higher than 2.17% and $\delta^{18}O$

ranges from 12.23 to 13.65 ‰. Variation diagrams of major and trace elements of rocks and of their biotites show fractionation trends from granodiorite G2 through granodiorite G3 and granite G4 to granite G5. The granite G1 does not fit these trends. The REE patterns of G2, G3 G4 and G5 are subparallel; all REE contents decrease, the negative Eu anomaly increases and anorthite content of plagioclase decreases in this sequence. The REE pattern of G1 cuts some of the others. A whole-rock Rb-Sr isochron for G2, G3 and G4

yields 293 ± 3 Ma and initial $^{87}Sr/^{86}Sr$ ratio of 0.7123 ± 0.0001 . The least squares modellization indicates that the granodiorite G3 and the granites G4 and G5 are the product of fractional crystallization of the granodioritic magma G2 controlled by separation of plagioclase, biotite, quartz and ilmenite. The geochemical differences between granite G1 and granodiorite G2 are mainly attributed to different degrees of partial fusion of the metasedimentary source rocks.