

The composition of zircon in peraluminous Variscan granites from Northern Portugal

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A group of peraluminous Variscan plutons were selected from the study of zircon composition. The selected plutons are: the post-D₃ Vila Pouca de Aguiar and the Lavadores plutons [1, 2] and the late-D₃ Vieira do Minho pluton [3]. The zircons occur as euhedral to subhedral crystals and exhibit finely concentric oscillatory zoning in BSE imaging. Internal zoning is mainly related to variations of Hf, Y, U and Th concentrations. Compositional ranges in zircon from all granites are present in Figure 1.

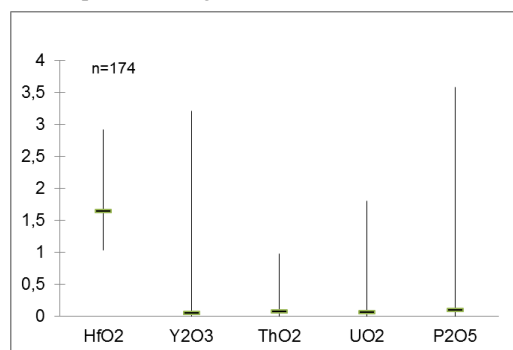


Figure 1: Compositional variation of zircons. Bar shows the complete range of zircon composition (vertical line), including the median (short horizontal line).

The zircon crystals have Zr/Hf ratio varying between 29 to 56, with no significant differences between the different granites. These values are in the same range of other peraluminous granites [5] and are in accordance with a crustal signature of zircon as suggested by several authors [4, 5]. The range of Zr/Hf values in zircon crystals of the studied granite plutons overlaps with that of the potential protholites proposed in the genesis of these peraluminous granites, namely meta-igneous crustal sources at different levels [1, 3].

[1] Martins *et al.* (2009) *Lithos* **111**, 142-155 [2] Martins *et al.* (2011) *CR Geoscience* **343**, 387-396 [3] Martins *et al.* (2013) *Lithos* **162-163**, 221-235 [4] Pupin (2000) *Trans. R. Soc. Edinb.: Earth Science* **91**, 245-256 [5] Pérez-Soba *et al.* (2007) *The Canadian Mineralogist* **45**, 509-527.

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Sr and Pb isotopes in surface water and bottom sediments from a public water supply reservoir, São Paulo, Brazil

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São Paulo is the biggest city of South America, with almost 20 million people living in its metropolitan area (MASP) of almost 6000 km². This population is mainly supplied by public surface water reservoirs, one of them being the Guarapiranga Dam, which provides water to 3,7 million people that live in the southeast of MASP. The Guarapiranga Dam surroundings are occupied by more than 800 thousand people that may compromise the quality of its waters. In order to investigate the existence of anthropogenic influences on the surface water of Gurapiranga Dam, the chemical composition of water and the surroundings rocks and sediments, as well as the Sr and Pb isotopic ratios of them, were analysed.

The results obtained from samples of water and sediment (bottom or margins), indicate that the water collected in only one point showed evidence of sewage contamination with the presence of high nitrate (>20 mg/L). In the sediments and bottom margin appeared high concentration of copper in the closest points of catchment water by the supply company. The presence of copper may be associated with the use of copper sulfate as algicide to prevent the eutrophication process of the reservoir and occurs mainly in the deepest parts of the dam.

The Sr isotope data indicated as well as the Pb isotopes, that the surface waters isotopic ratios are similar to the leachate (nitric and hydrochloric acids 3.5 M) from the bottom and margins sediments, that exhibited high content of copper (0.717) and organic matter, or with higher clay content. Furthermore, the Sr isotope ratios are also similar to those of rainwater (0.715). As for the Pb isotopes, the Sr isotopes do not clearly distinguish anthropogenic sources from natural sources, since both sources have similar ratios to surface waters in this case. Further studies should indicate that isotopes can be used as monitors of safe drinking water.