

## **The Pirrit Hills granite with tetrad REE patterns in West Antarctica**

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The Pirrit Hills granite occurs as an isolated plutonic body in the Ellsworth-Whitmore Mountains crustal block, West Antarctica. The Pirrit Hills granite has high SiO<sub>2</sub> (74~77 wt.%) contents and is highly homogeneous, strongly fractionated, and mildly peraluminous. It has most of the features associated with the definition of A-type granites.

The chondrite-normalized REE patterns of the Pirrit Hills granite are very flat with significant negative Eu anomalies and tetrad effect. Monecke et al. (2002, 2007) proposed the method for quantification of the tetrad sizes. Accordingly, all samples with values of  $T_1 > 0.1$  are considered showing the tetrad effect.

On the Rb-Sr and Sm-Nd isochron diagrams, initial <sup>87</sup>Sr/<sup>86</sup>Sr ratios and <sup>143</sup>Nd/<sup>144</sup>Nd ratios were  $0.711 \pm 0.025$  (2 $\sigma$  SE) and  $0.512207 \pm 0.000017$  (2 $\sigma$  SE), respectively. The Nd model age ( $T_{DM1}$ ) of the Pirrit Hills granite shows unreasonable values which is negative old, due to the REE tetrad effect. The two-stage model ages ( $T_{DM2}$ ) of the Pirrit Hills granite range from 1,285 to 1,344 Ma. Therefore, our data may indicate that the Pirrit Hills granite was formed by remelting of Mesoproterozoic mantle-derived crustal materials. However, we need further study to understand REE mobility and the relationship between the REE tetrad effect formation processes and isotopic fractionations during the magmatic differentiation.