

**Table S4**

Major element-based least-squares modeling for Nb-Ta-rich and Nb-Ta-poor Iberian RMGs

Modeling 1	Fractionating assemblage (%)							SSE
	Qtz	Mus	Kfs	Pl	Ap	Grt	Bt	
<b><i>Golpejas RMG</i></b> <b><i>(Nb-Ta-rich)</i></b>								
Poorly evolved->Highly evolved (Sample FAD007→FAD026C)	-	-1.74 (8.93)	-9.57 (49.15)	-7.34 (37.7)	-0.82 (4.19)	-	-	0.23
<b><i>Penouta RMG</i></b> <b><i>(Nb-Ta-rich)</i></b>								
Bottom->Apical zone (Sample P06053→P02660)	-21.6 (60)	-7.7 (21.4)	-4.8 (13.5)	-	-	-1.8 (5.1)	-	0.001
<b><i>Pedroso de Acim RMG</i></b> <b><i>(Nb-Ta-poor)</i></b>								
Sample PA-1→PA-3	-2.85 (29.80)	-1.67 (17.45)	-3.69 (38.62)	-	-0.14 (1.42)	-	-1.22 (12.7)	0.002

SSE: Sum of squared residuals; F: percentage of residual liquid; minerals abbreviations after [161]; numbers in brackets are cumulate minerals normalized to 100; modeling carried out with the OPTIMASBA code [93].  
Modeling for Penouta granite from [2].