**Supplementary Figure. 1.** Elements profiling of feldspar using Energy Dispersive Spectra.

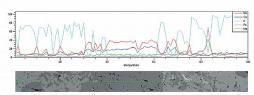
**Supplementary Figure. 2.** An inverse isochron plot (Between <sup>40</sup>Ar-<sup>39</sup>Ar and <sup>40</sup>Ar-<sup>36</sup>Ar). The intercept with the <sup>36</sup>Ar/ <sup>40</sup>Ar axis gives the trapped Argon composition. The intercept with the <sup>39</sup>Ar/ <sup>40</sup>Ar axis gives the radiogenic Argon composition.

## Supplementary Fig. 1

Line scan in EDS showing replacement of Na (red line) by K (sky blue) at the margins and interstitial spaces of plagioclase (BSE image).



Date: 04/03/2008 15:48:25 Image size: 1000 x 750 Mag: 274.63251 x HV: 20.0 kV



Line scan Date: 04/03/2008 15:52:10 Measure time: 2:42 min Start: (17,320) End: (1000,310) Length: 1200 µm

## Supplimentary Fig. 2

