Identifying crystal nucleation mechanisms in a synthetic trachybasalt: a multimodal approach

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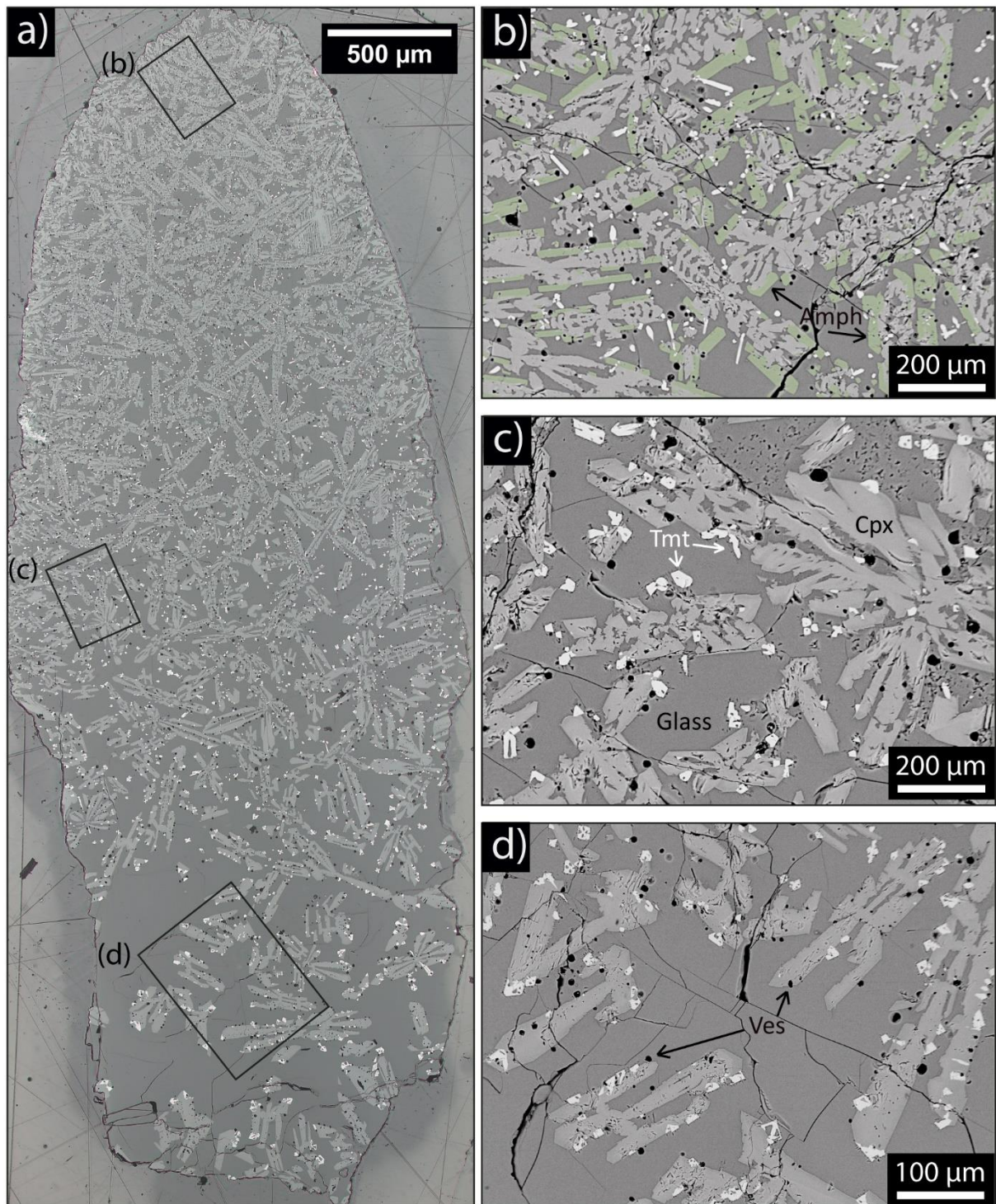ORCID: 0000-0003-3409-9531

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Supplementary Figure S1 a) Reflected light microscope image showing sample 1100w-30min; Cpx grains are grey; Tmt grains are light grey; Bubbles are black; glass is in darker grey, only in S1b, Amphibole is in translucent green. S1b is from the colder portion of the experiment; and c) is from the middle portion of the sample, and d) is from the hotter portion of the sample.
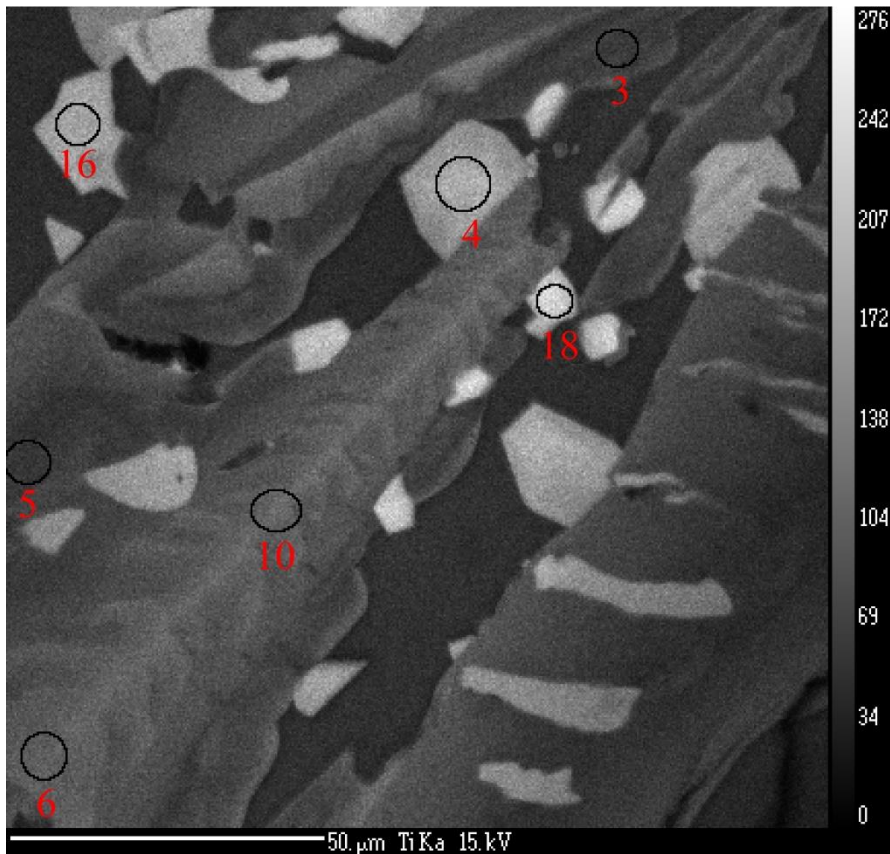
EMPA maps calibration

In order to calibrate the EMPA chemical map we acquired single point measurements, which locations are shown in Fig.1
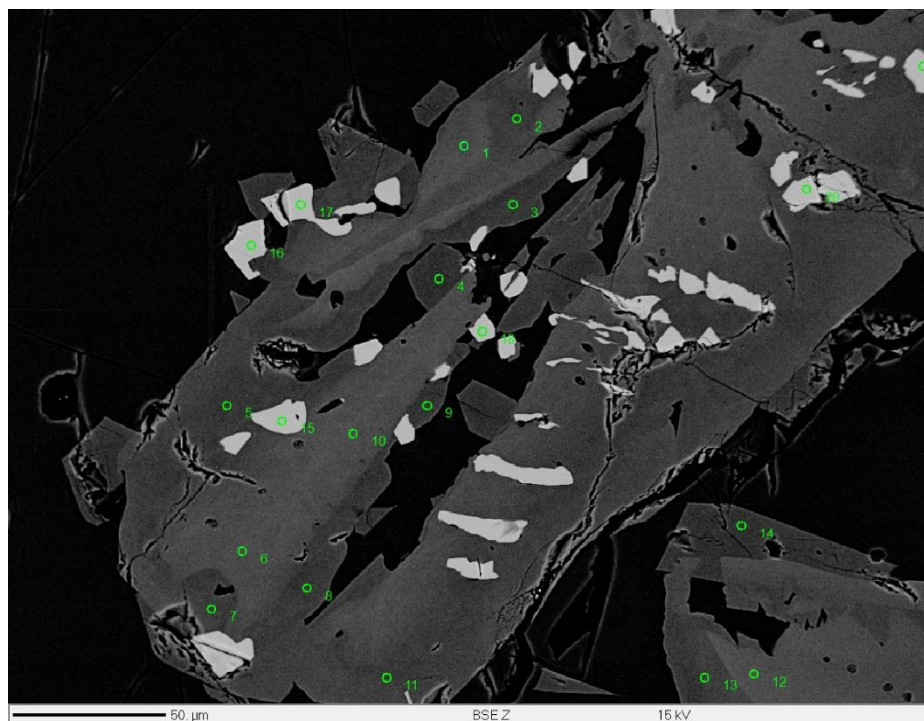
Supplementary Figure S2 BSE images showing the single spot analysis locations acquired

Supplementary Figure S3 Ti chemical acquired through EMPA. The grey values correspond to the amount of Ti present in the map. The black circles represent the spots where the single spots analyses were performed.

The median of the grey value inside the black circles in Fig.4 have been correlated to amount of TiO_2 analysed during the single spot analysis as shown in the following table and Fig.4

| sample 1100w-8h	element TiO2	grey value median	phase
point3	1.2133	59	Cpx
point 4	3.6533	170	Amph
point 5	1.2483	54	Cpx
point 6	1.9165	93	Cpx
point10	2.0463	99	Cpx
point16	3.8696	163	Tmt
point18	3.6533	205	Tmt
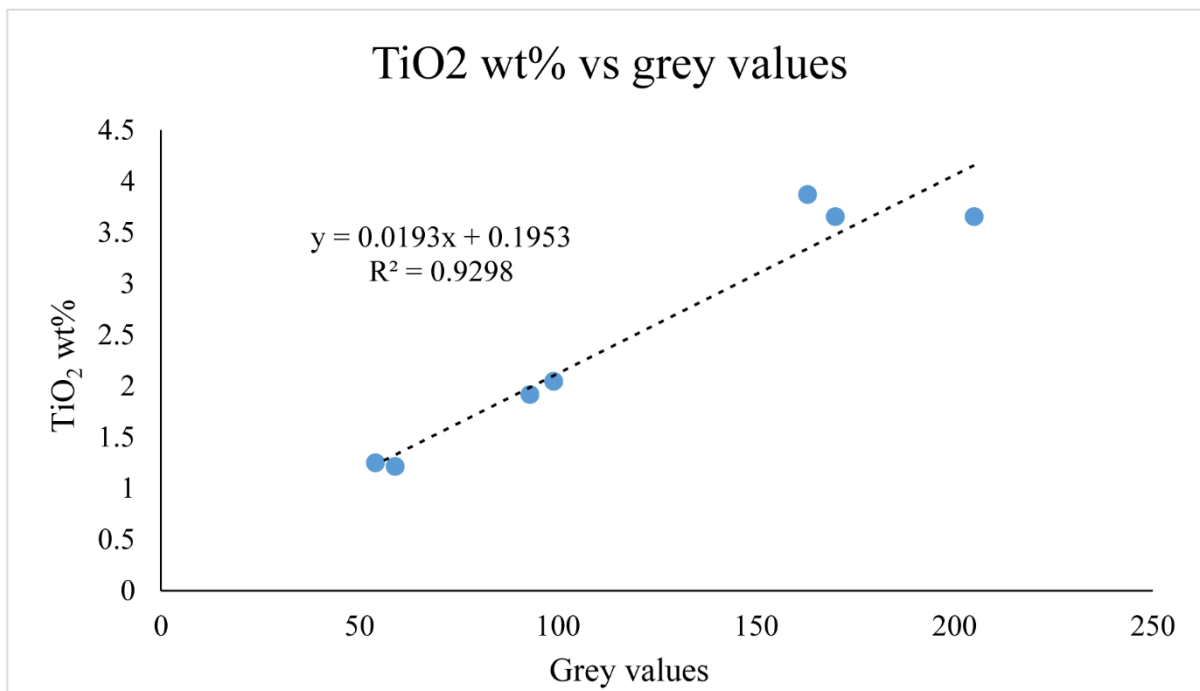
Supplementary Figure S4 graph correlating the grey values (in abscissa axis) and the relative TiO_2 amount (in ordinate axis) measured in the EBSD chemical map relative to Ti composition, and the single spot analysis respectively.

The ImageJ plugin "Calibrate…" has been used to calibrate the EBSD map relative to Ti content and the TiO_2 profile, shown as the black segmented line delimited between A and B (**Supplementary Figure S5**) has been measured (**Supplementary Figure S6**).
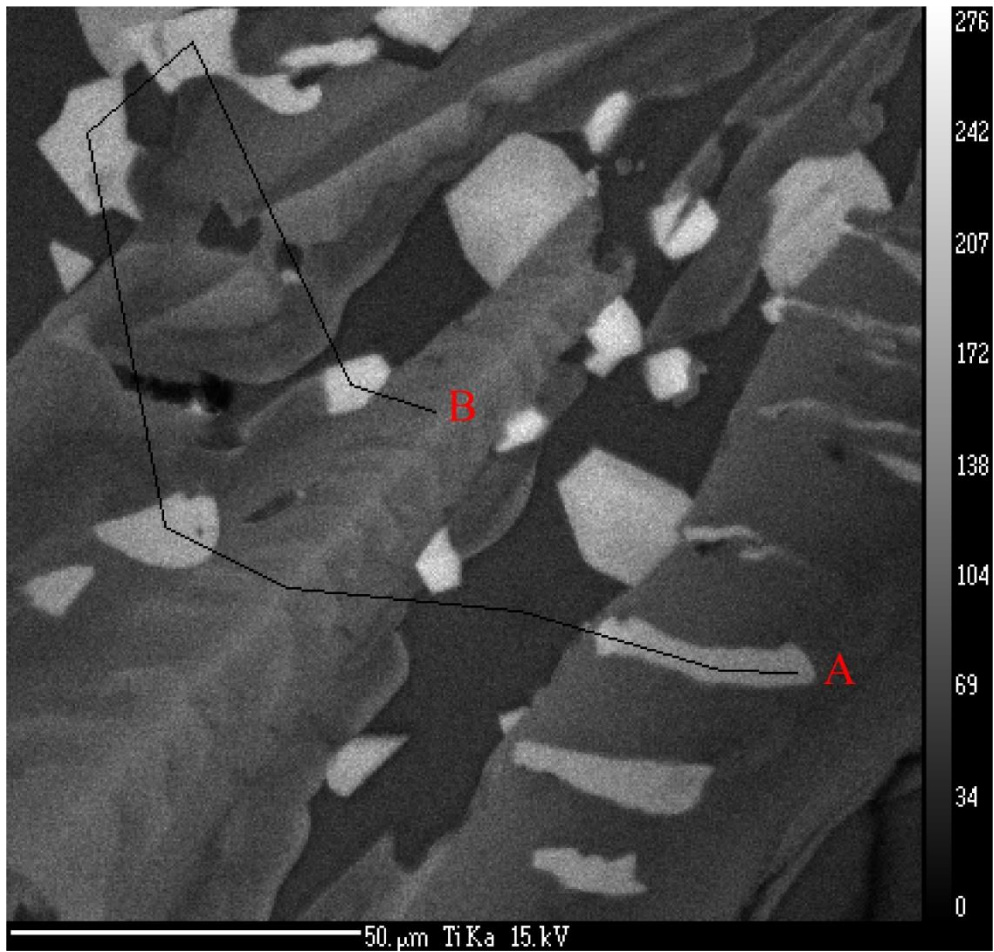
Supplementary Figure S5 Calibrated EMPA chemical showing the trace of the TiO_2 chemical profile investigated
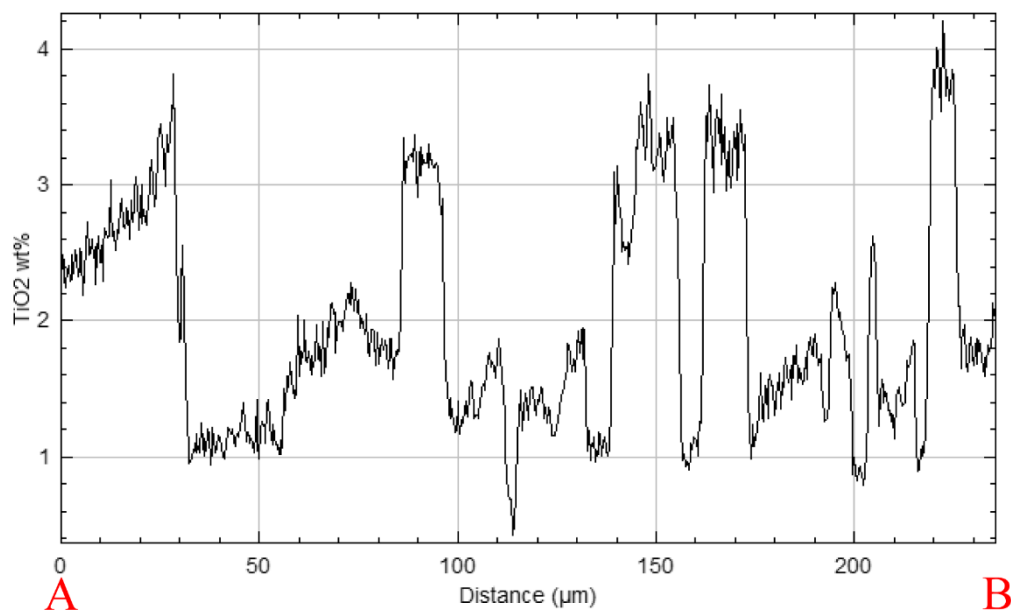
Supplementary Figure S6 graph showing the TiO2 content of the profile investigated. It is important to notice the increase in TiO_2 content in the Pop3 Tmt crystal at the beginning of the profile