

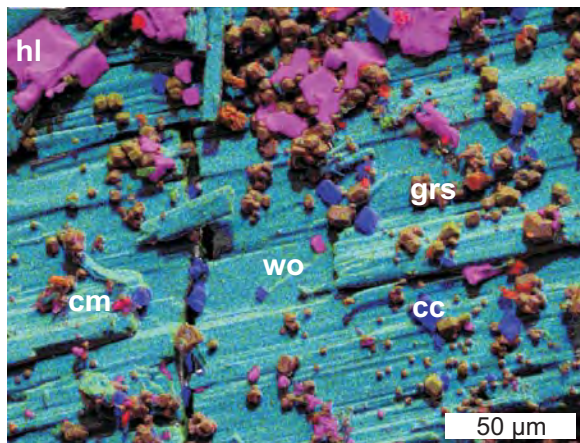
## Appendix Figure 1

The documentation of run products from the experiments includes (1) SEM (scanning electron microscope images of grain surfaces; (2) mineral distribution on the grain surfaces from single or merged element distribution maps (SEM data); (3) point analyses (SEM) represented as element distribution spectra; (4) element distribution maps from EMP (electron microprobe) on polished grain mounts.

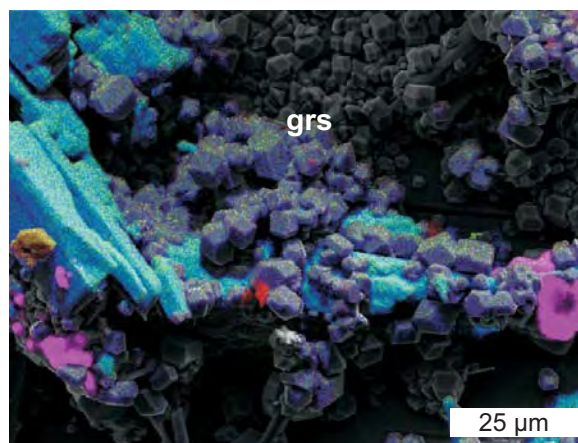
Sample order is increasing run-time of the experiments; all experiments were performed at 400 Mpa and 600°C.

Abbreviations of minerals (if not quoted different at the respective image) cc= calcite; cm=corundum; fl=fluorite; grs=grossular; hl=halite; prv=perovskite; rt=rutile; ttn=titanite; wo=wollastonite;

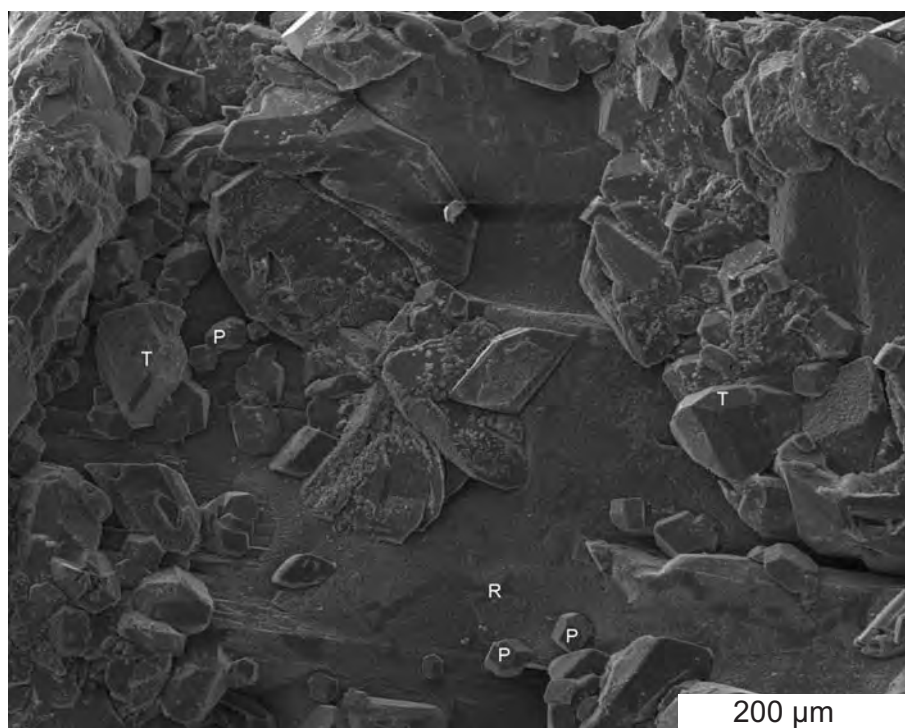
outer = material from the outer Au capsule;  
Inner =material from the inner Pt capsule



**Ttn4-outer-1**

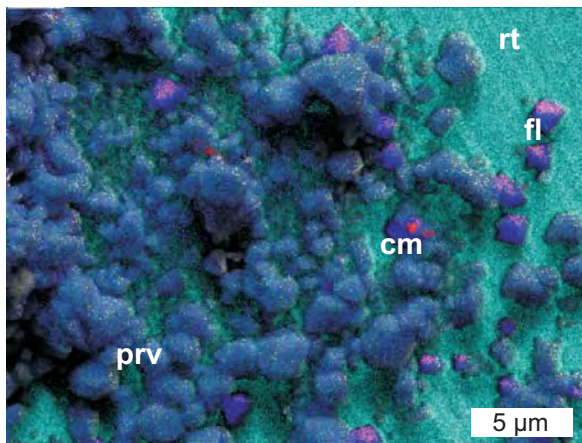


**Ttn4-outer-2**

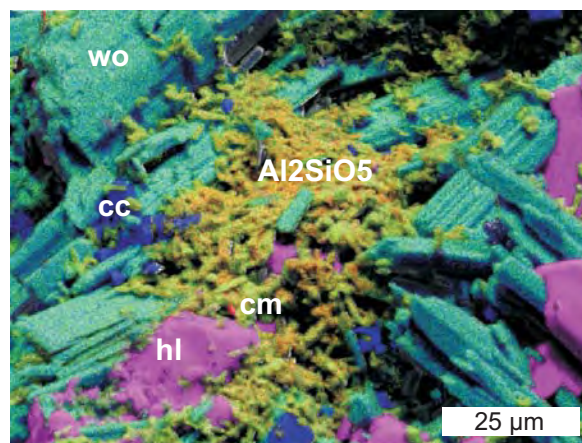


**Ttn4-inner**; T= titanite; R= rutile; P=perovskite

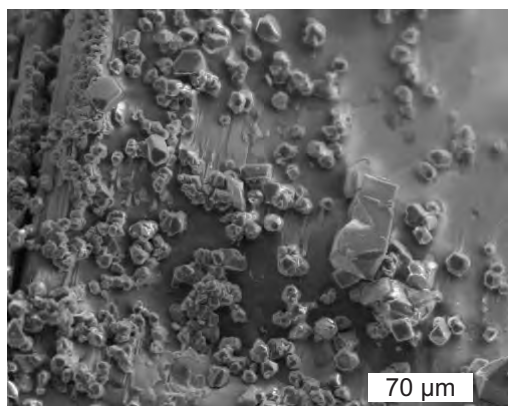




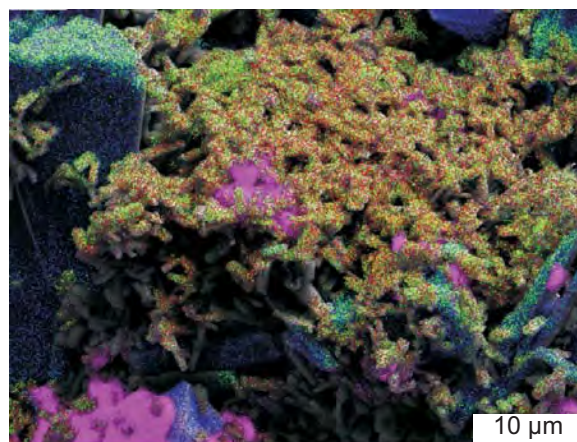
**Ttn7-inner-1**



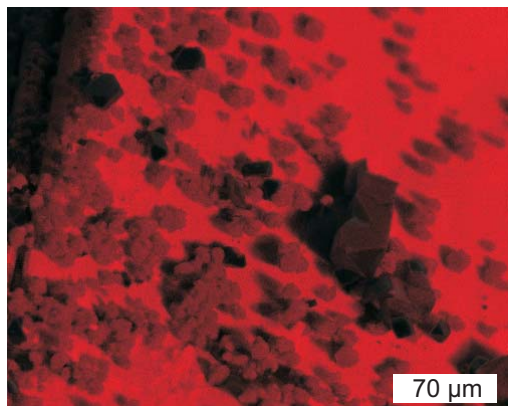
**Ttn7-outer-1**



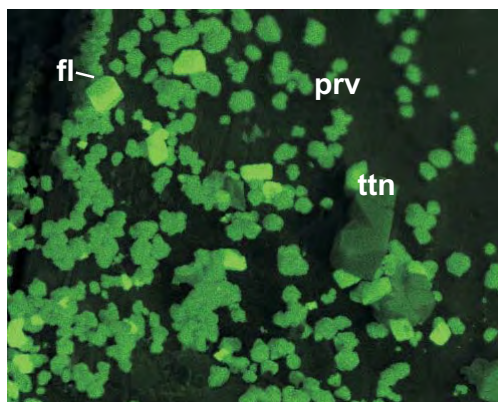
**Ttn7-inner-2 SEM image**



**Ttn7-outer-2**



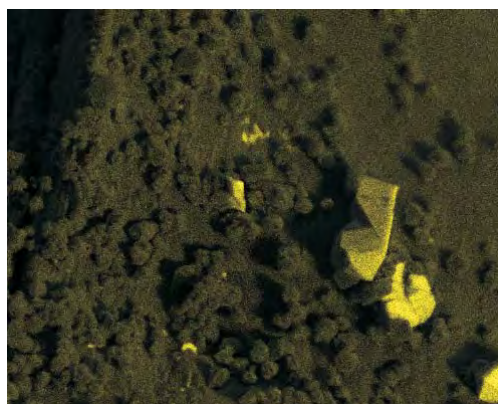
**Ttn7-inner-2 SEM element map Ti**



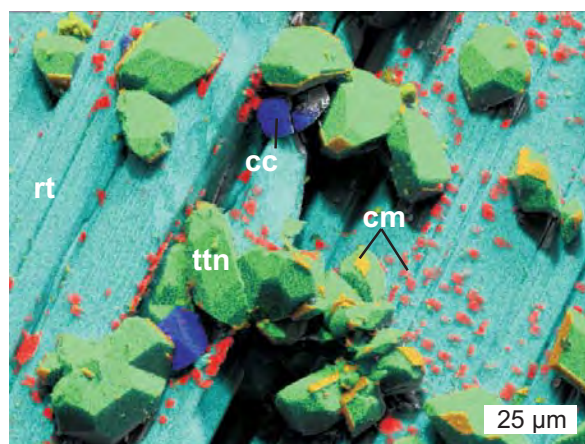
**Ttn7-inner-2 SEM element map Ca**



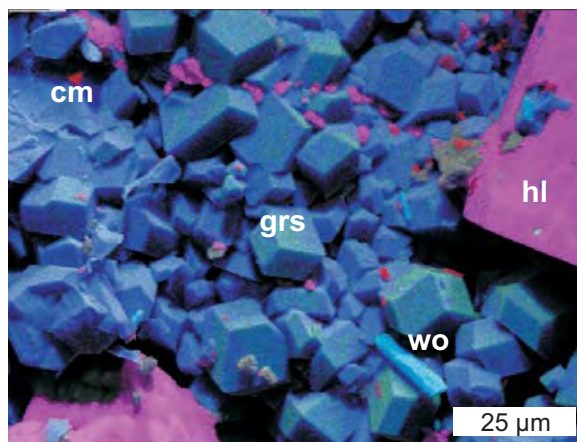
**Ttn7-inner-2 SEM element map Al**



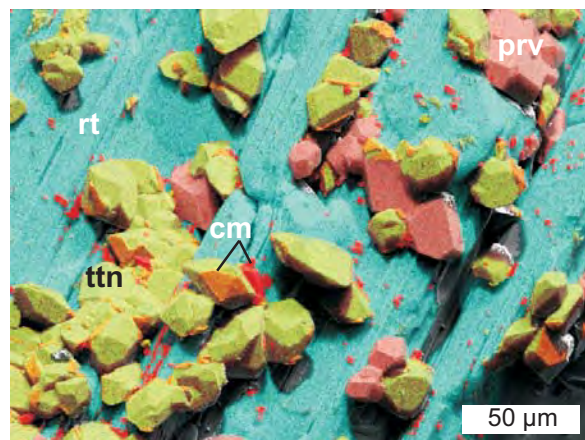
**Ttn7-inner-2 SEM element map Si**



**Ttn9-inner-1**

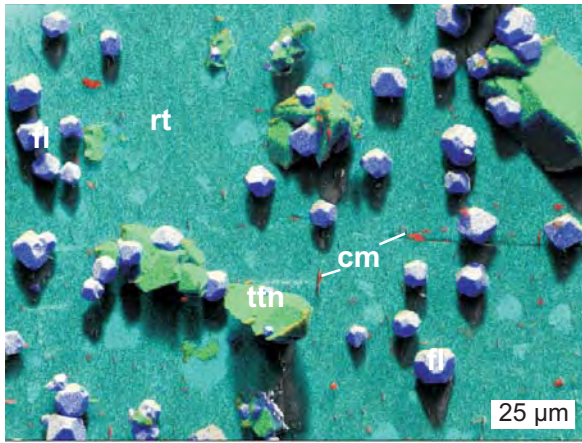


**Ttn9-outer**

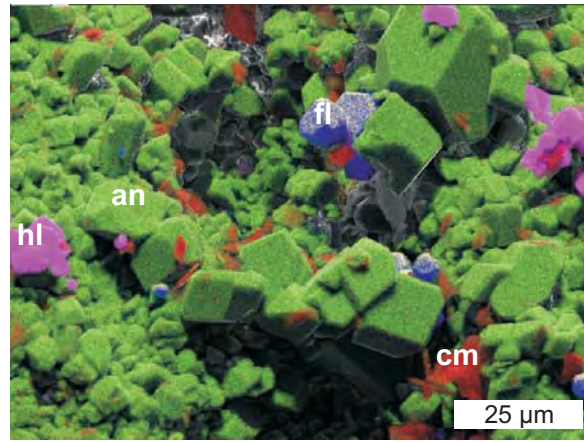


**Ttn9-inner-2**

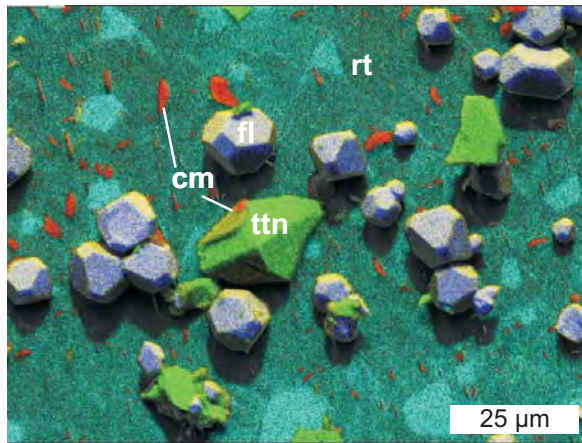




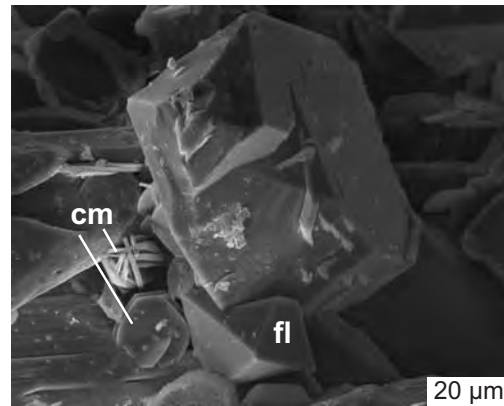
**Ttn10-inner-1**



**Ttn10-outer**

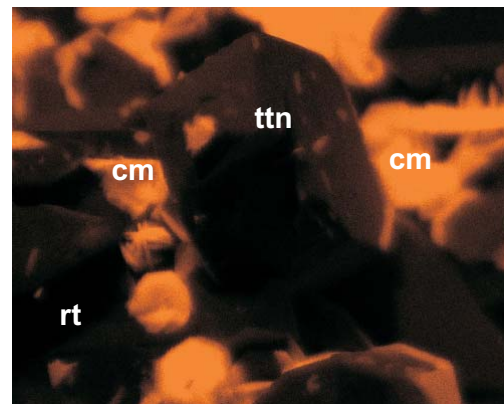
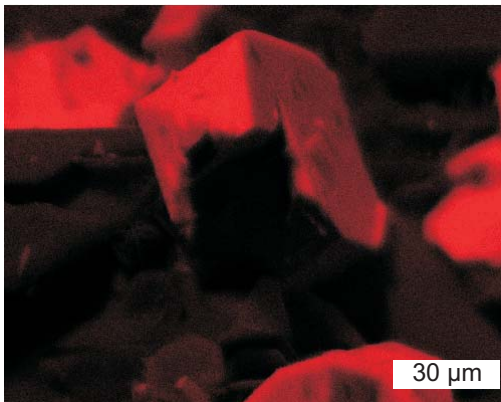


**Ttn10-inner-2**



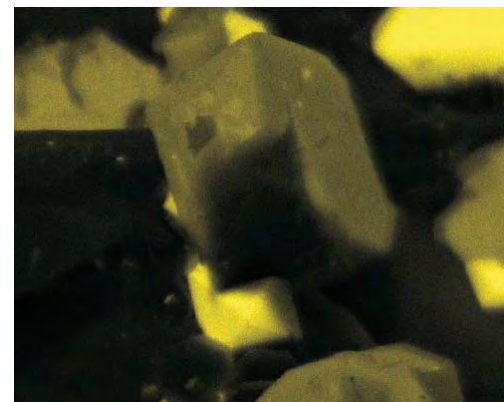
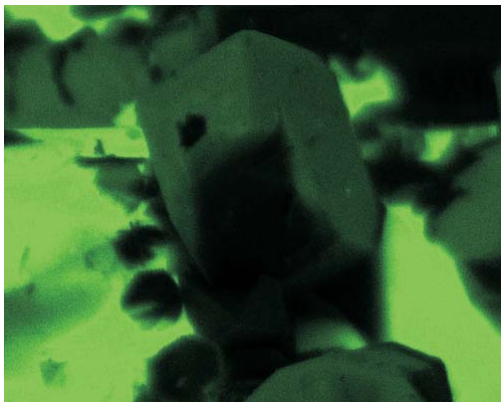
**Ttn10-inner-3**  
SEM image  
detail

**Ttn10-inner-3**  
SEM element  
map Si



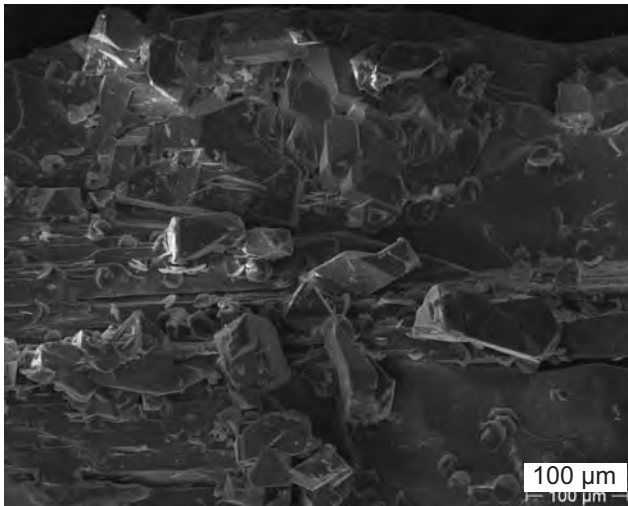
**Ttn10-inner-3**  
SEM element  
map Al

**Ttn10-inner-3**  
SEM element  
map Ti

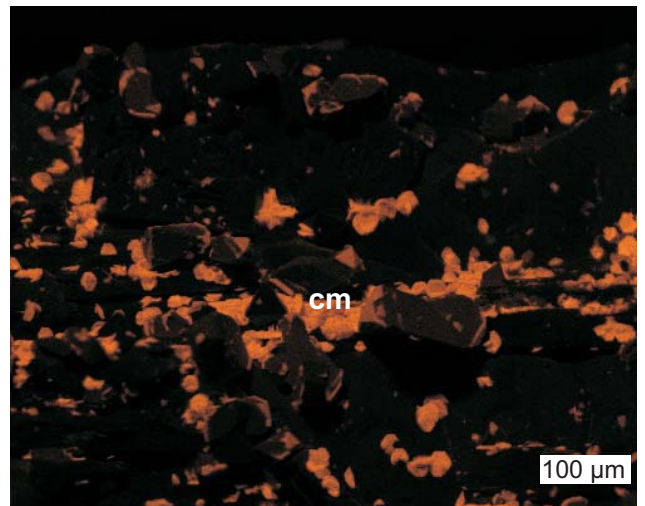


**Ttn10-inner-3**  
SEM element  
map Ca

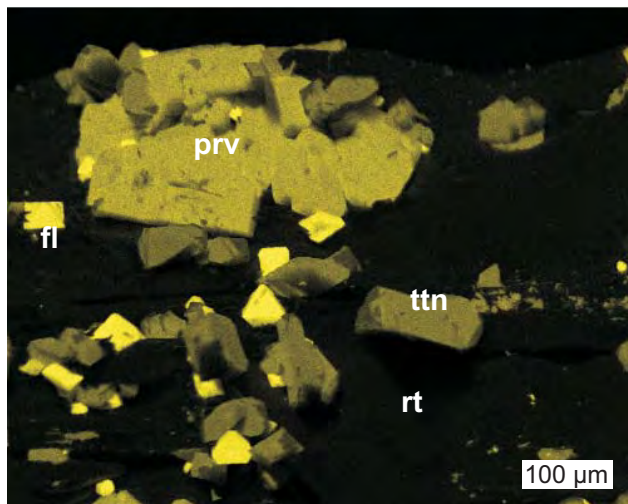




Ttn10-inner-4; SEM image



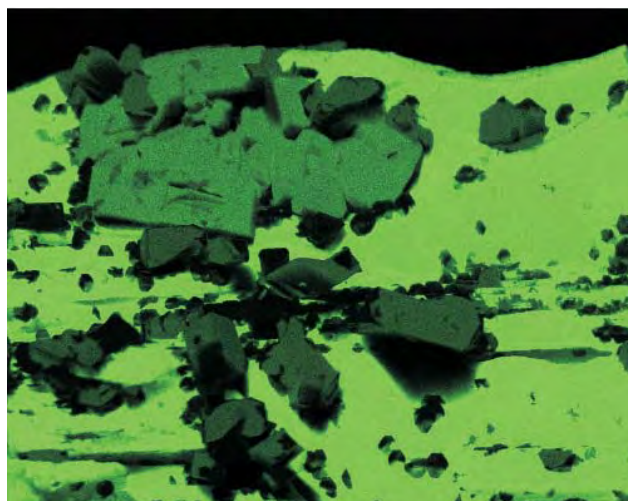
Ttn10-inner-4; SEM element map Al



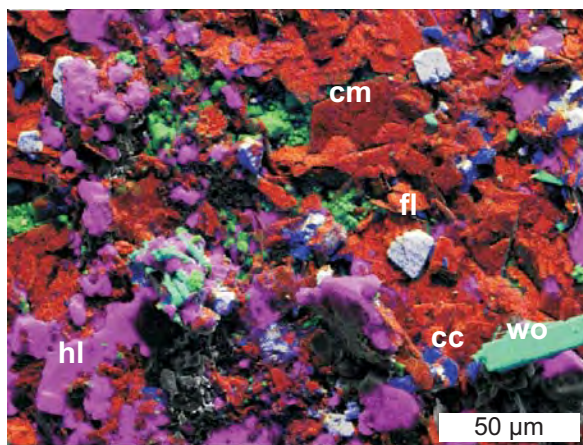
Ttn10-inner-4; SEM element map Ca



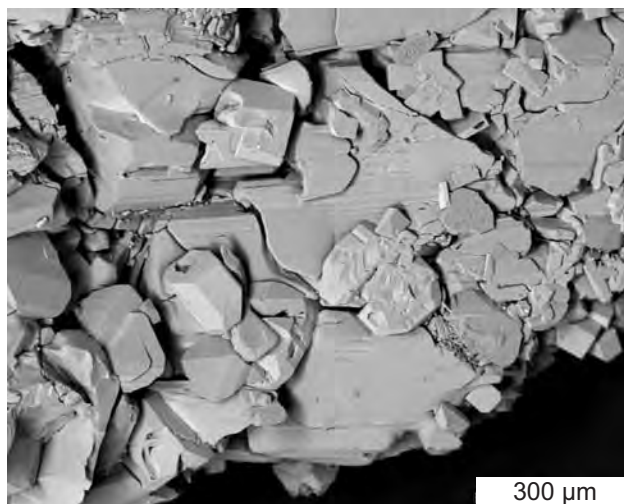
Ttn10-inner-4; SEM element map Si



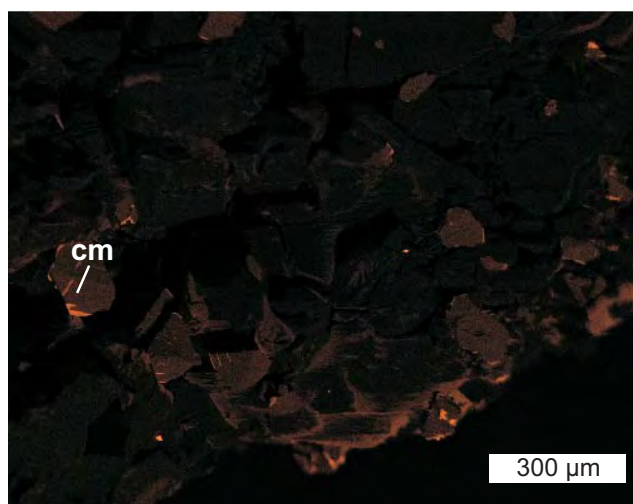
Ttn10-inner-4; SEM element map Ti



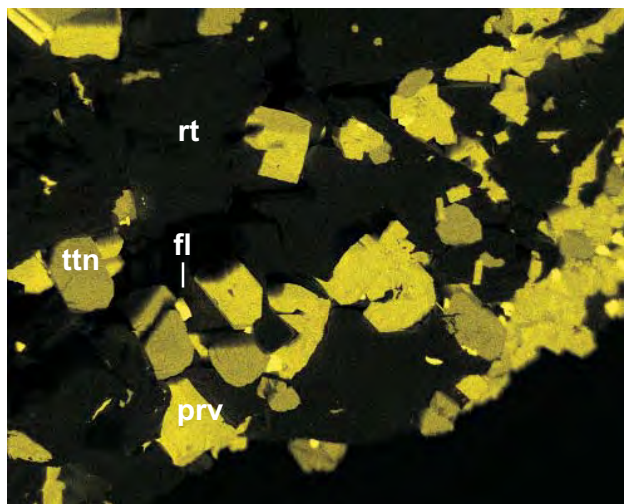
**Ttn2-outer**



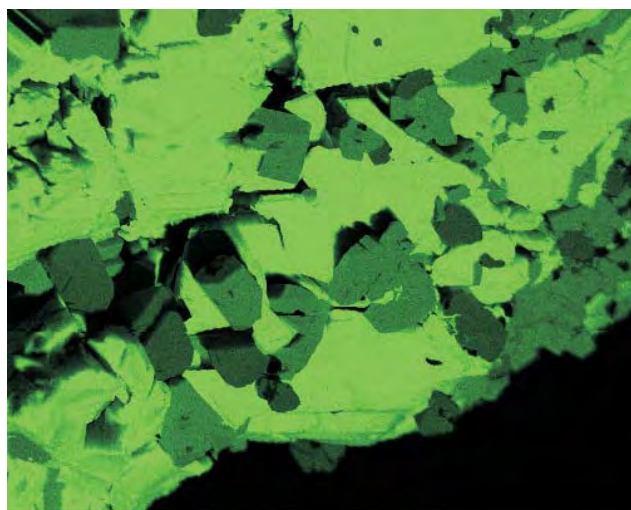
**Ttn2-inner; SEM image**



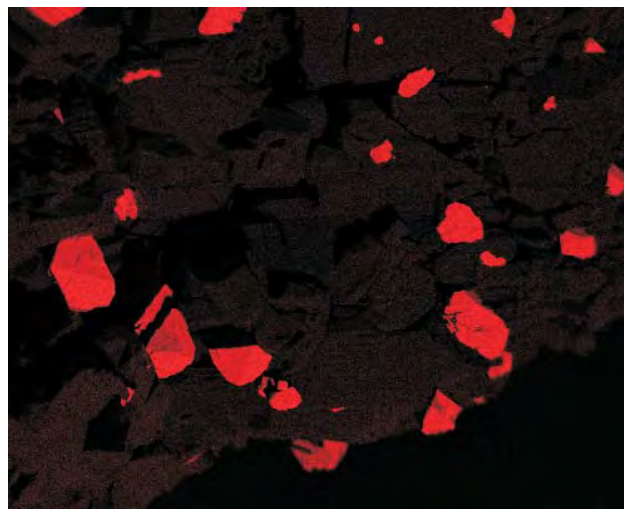
**Ttn2-inner; SEM element map Al**



**Ttn2-inner; SEM element map Ca**

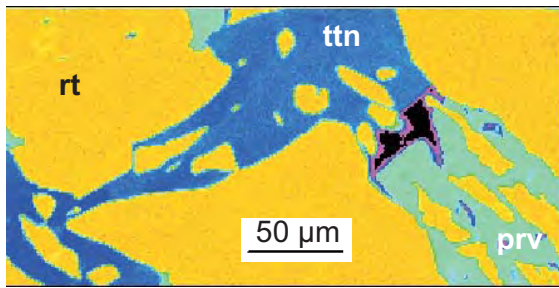


**Ttn2-inner; SEM element map Ti**

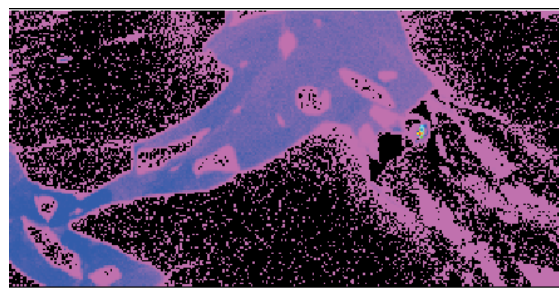


**Ttn2-inner; SEM element map Si**

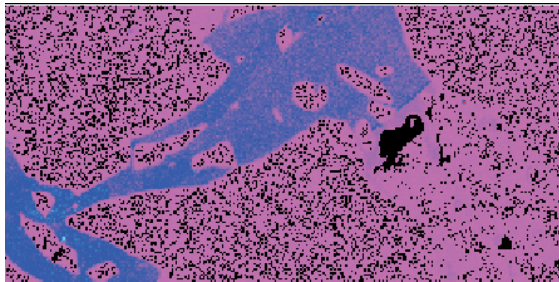




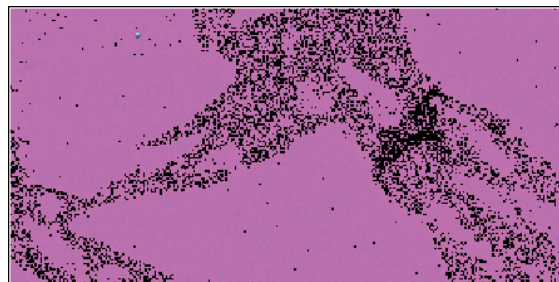
Ttn2 inner-2; EMP element distribution Ti



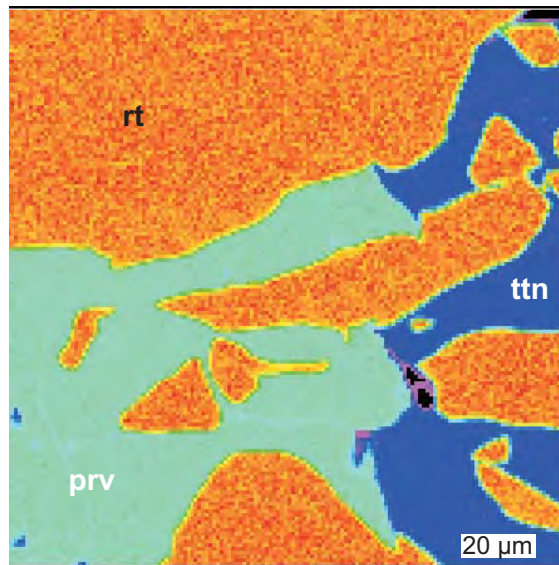
Ttn2 inner-2; EMP element distribution Al



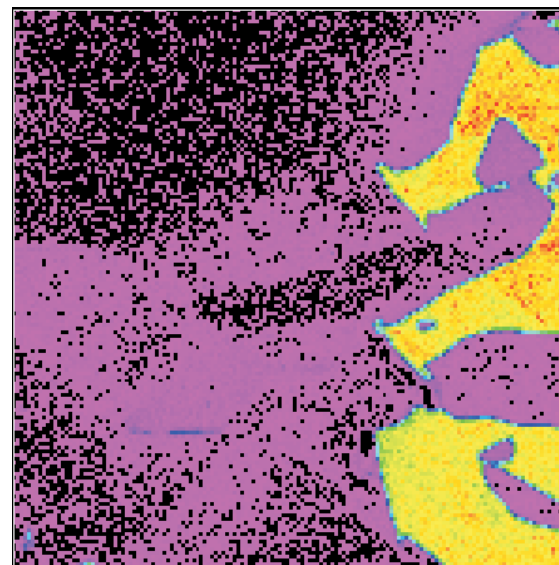
Ttn2 inner-2; EMP element distribution F



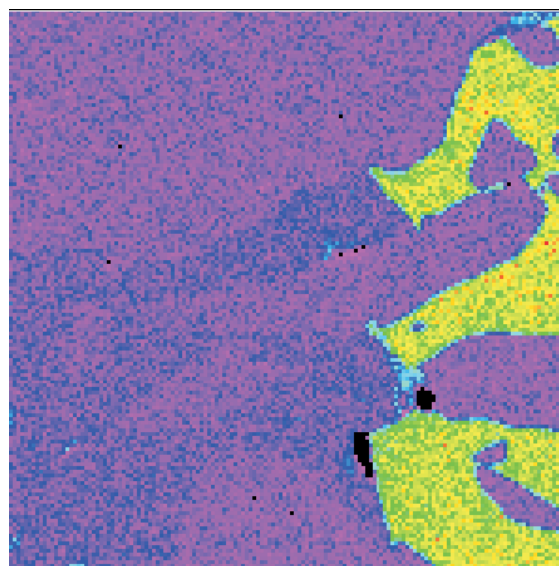
Ttn2 inner-2; EMP element distribution Fe



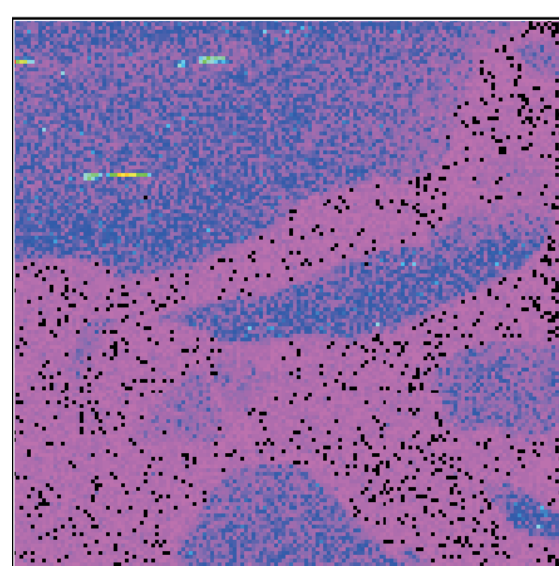
Ttn2 inner-3; EMP element distribution Ti



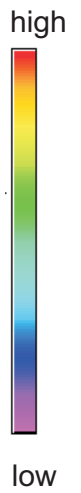
Ttn2 inner-3; EMP element distribution Al



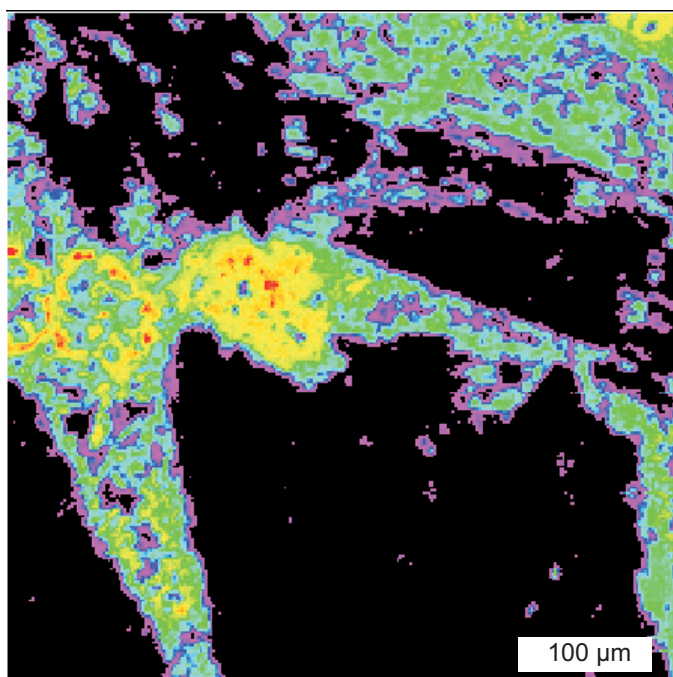
Ttn2 inner-3; EMP element distribution F  
Appendix Figure 1; page 8; Ttn2 (7 days; F)



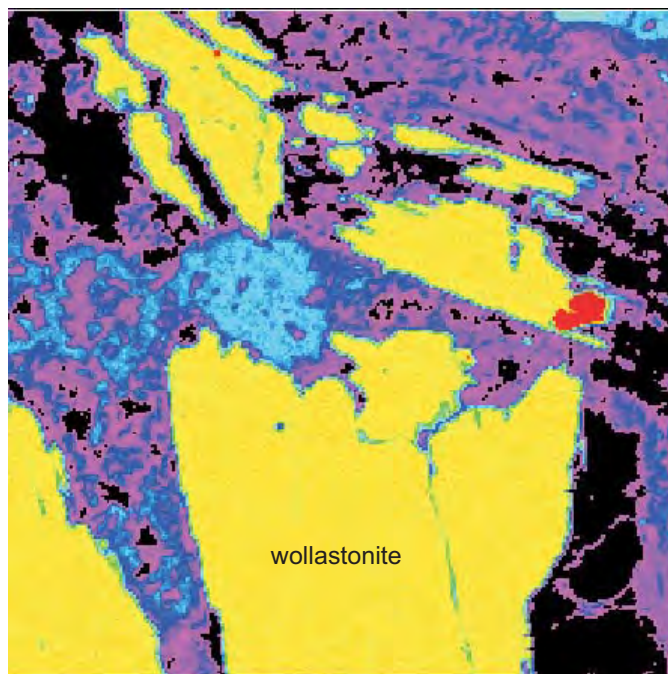
Ttn2 inner-3; EMP element distribution Fe



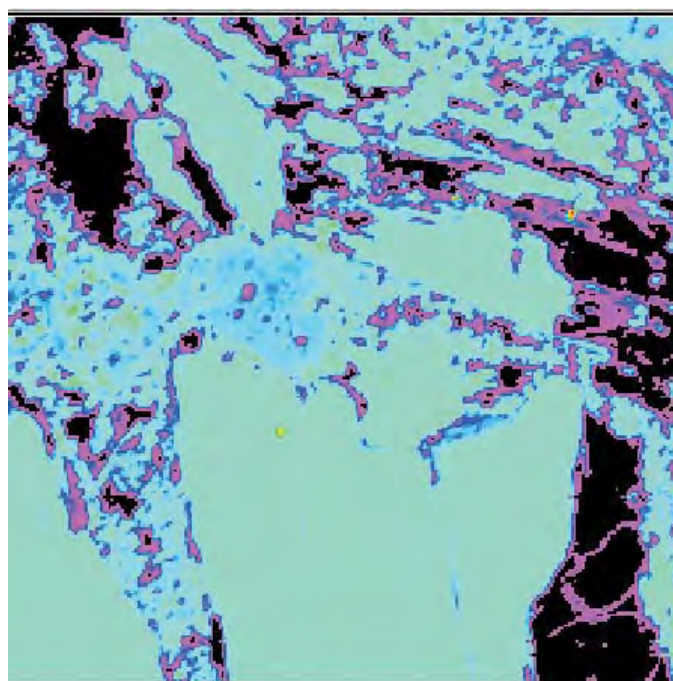




Ttn2 outer-2; EMP element distribution Al

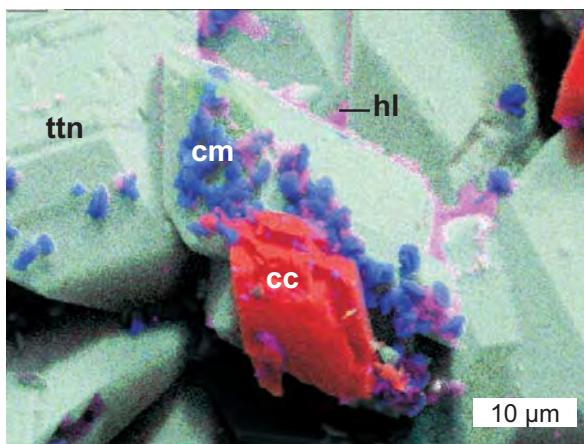


Ttn2 outer-2; EMP element distribution Ca

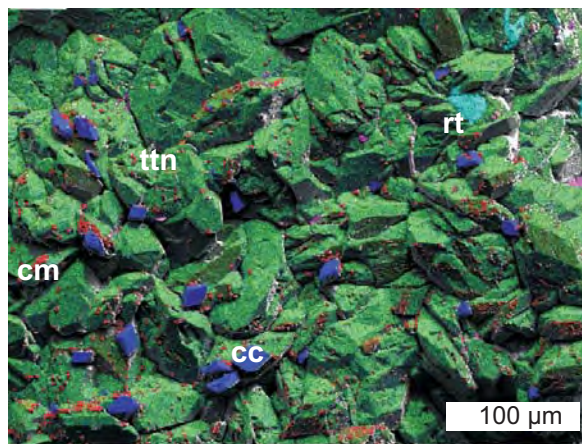


Ttn2 outer-2; EMP element distribution Si

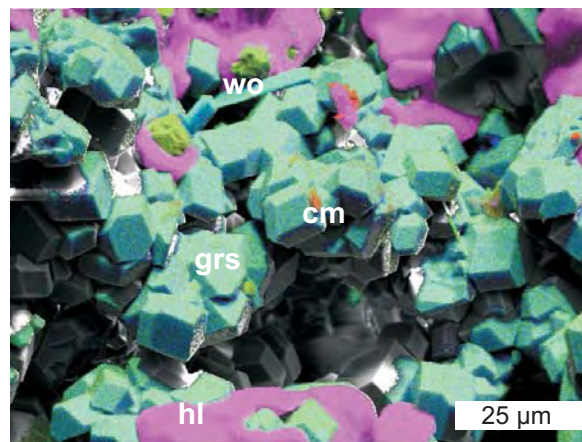




**Ttn8-inner-detail**

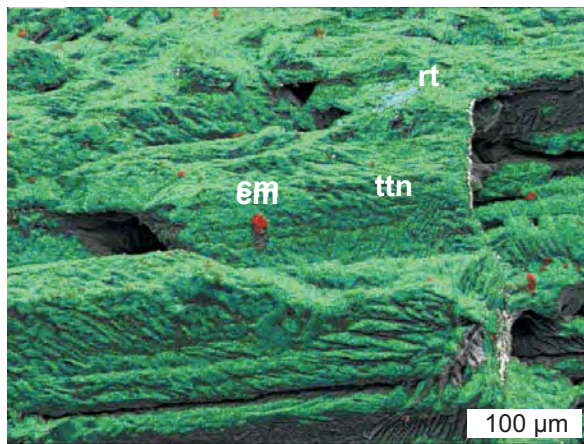


**Ttn8-inner-1**

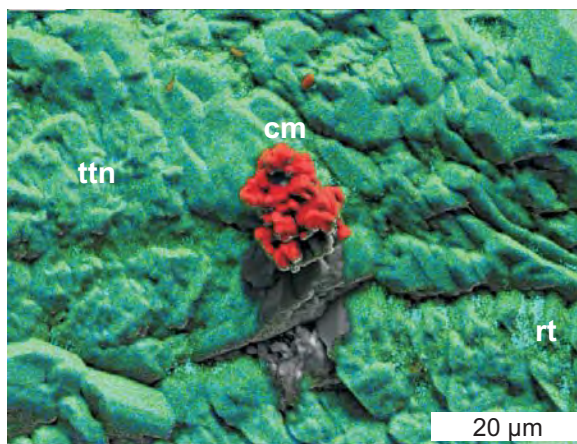


**Ttn8-outer**

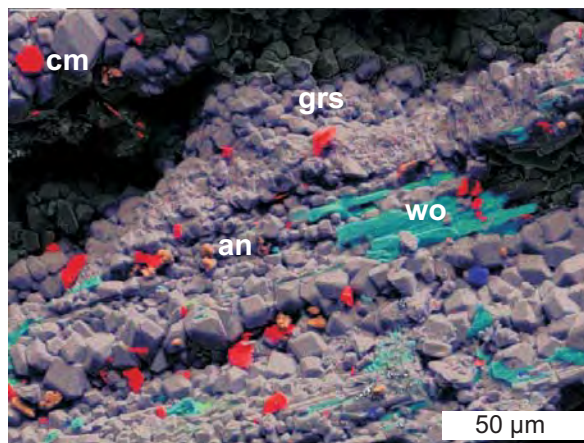




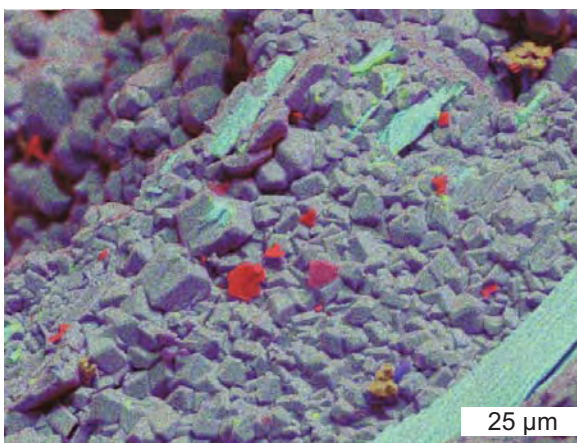
Ttn1-inner-1



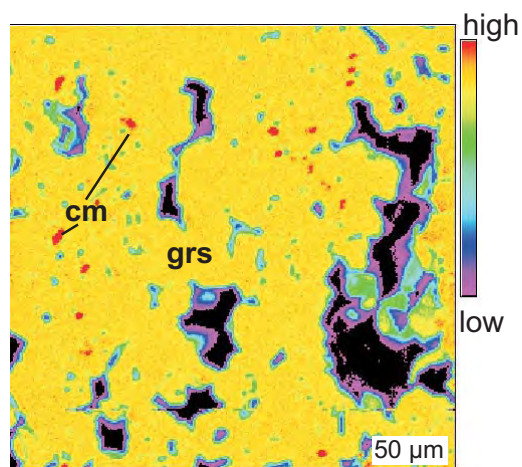
Ttn1-inner-1-detail



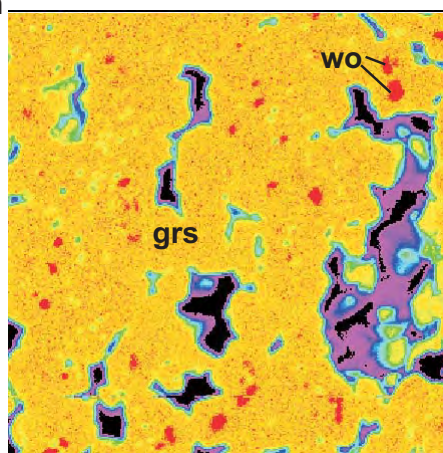
Ttn1-outer-1



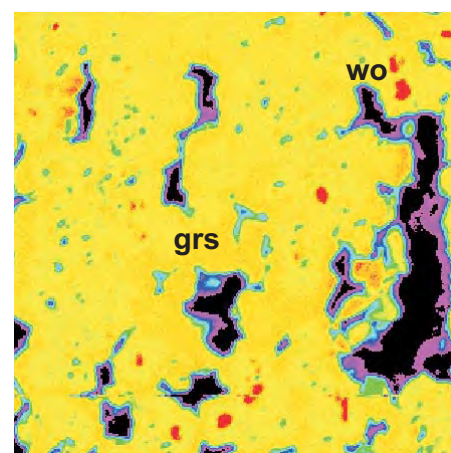
Ttn1-outer-2



Ttn1-outer  
EMP element distribution map: Al

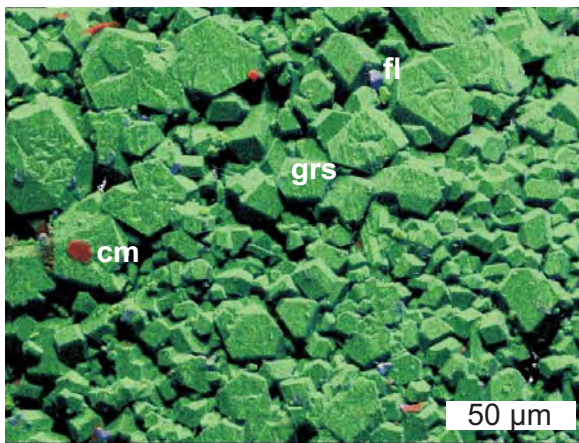


Ttn1-outer  
EMP element distribution map: Ca

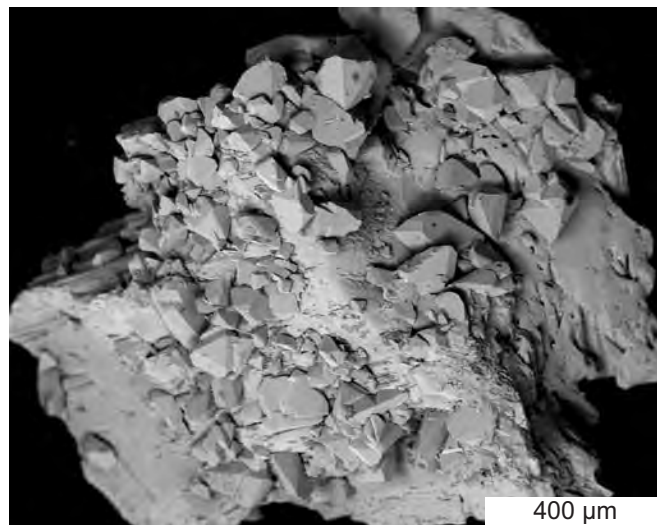


Ttn1-outer  
EMP element distribution map: Si

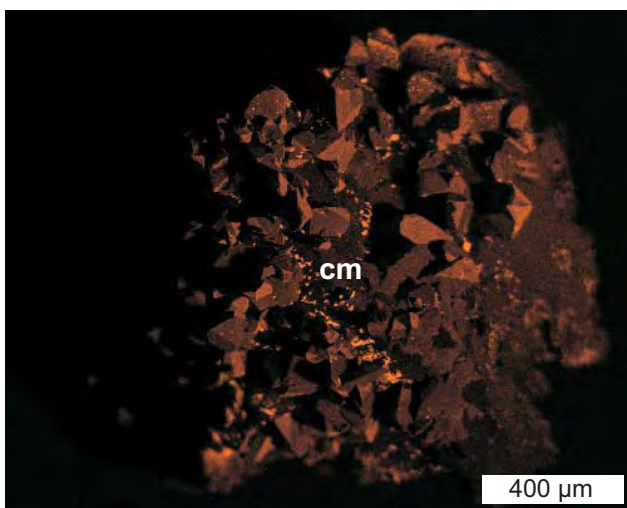




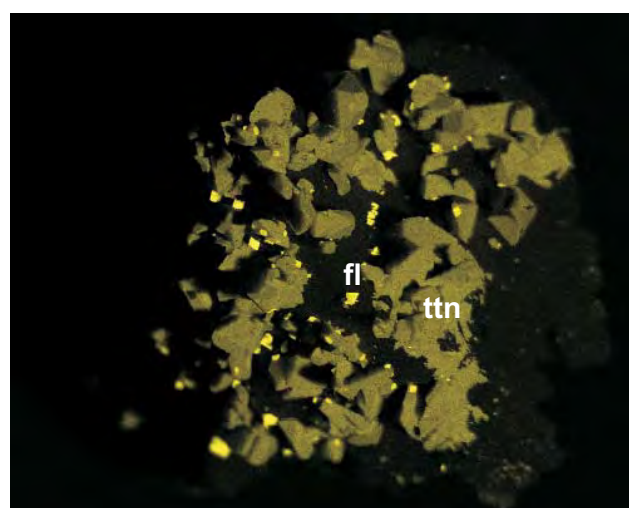
Ttn12-outer



Ttn12-inner-1; SEM image



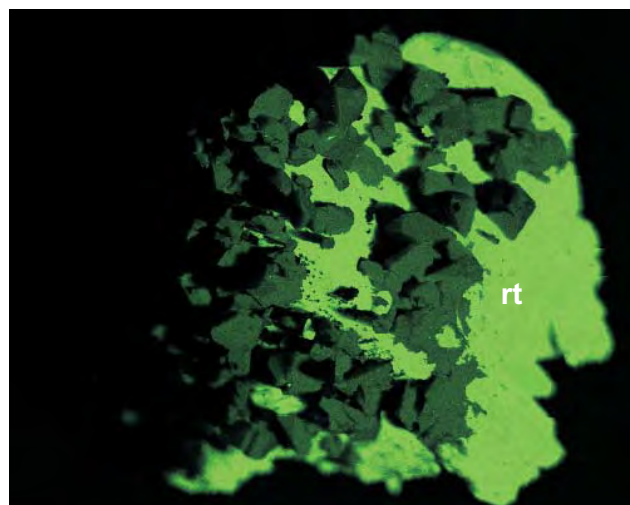
Ttn12-inner-1; SEM element map Al



Ttn12-inner-1; SEM element map Ca

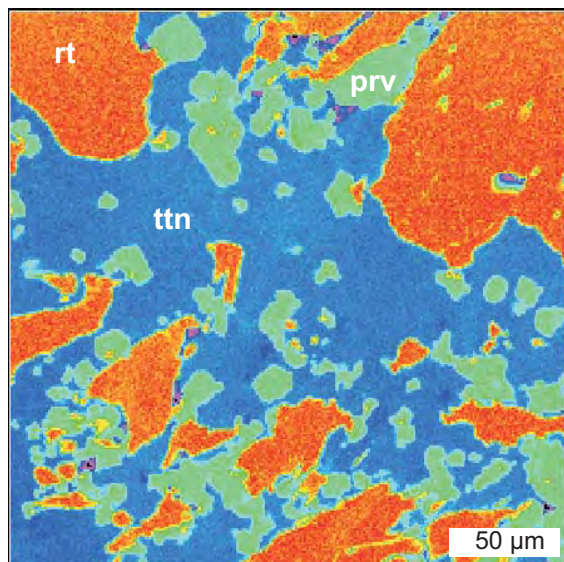


Ttn12-inner-1; SEM element map Si

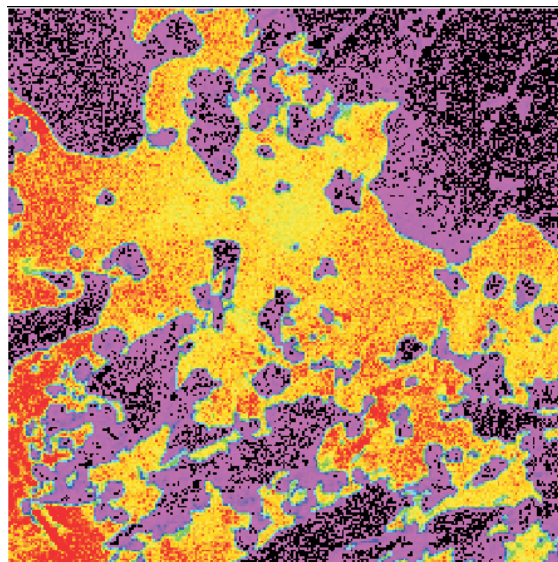


Ttn12-inner-1; SEM element map Ti

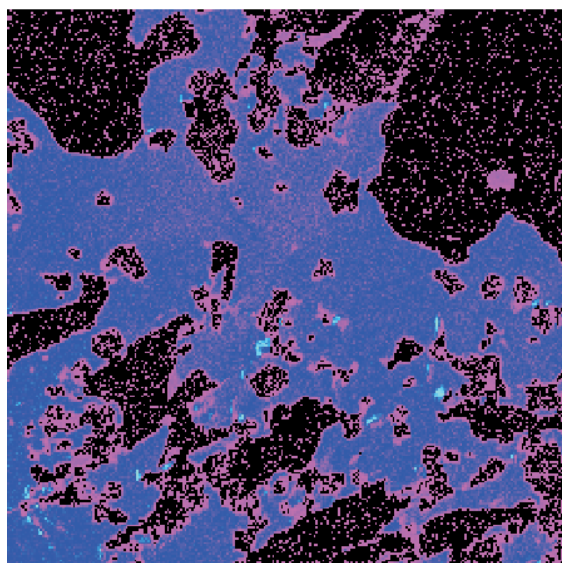




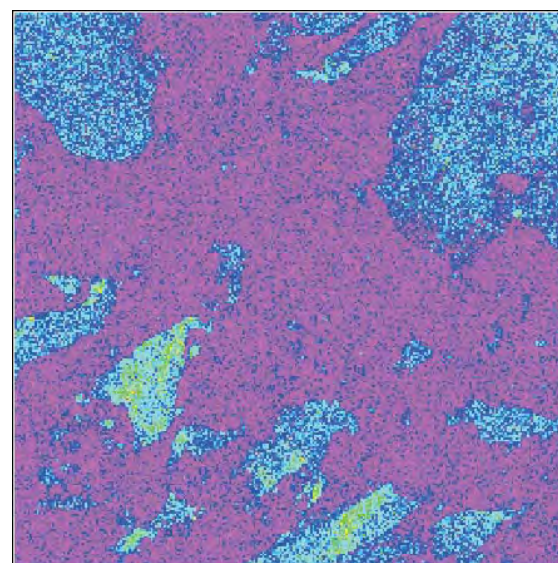
Ttn12-inner-2; EMP element map Ti



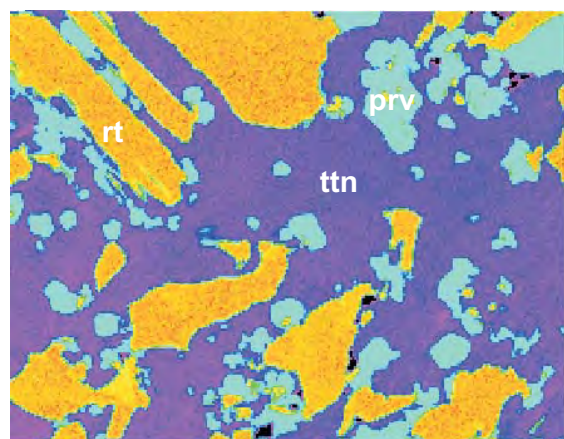
Ttn12-inner-2; EMP element map Al



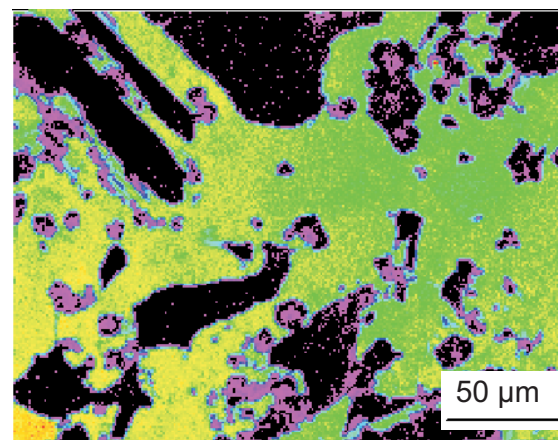
Ttn12-inner-2; EMP element map F



Ttn12-inner-2; EMP element map Fe

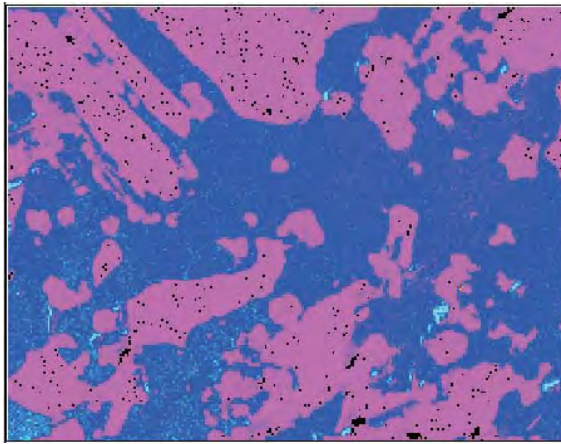


Ttn12-inner-3; EMP element map Ti

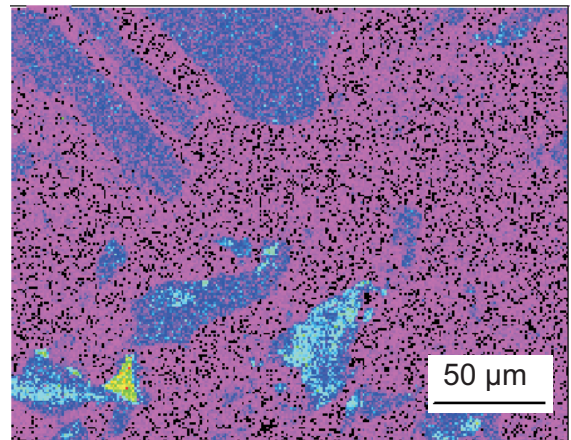


Ttn12-inner-3; EMP element map Al

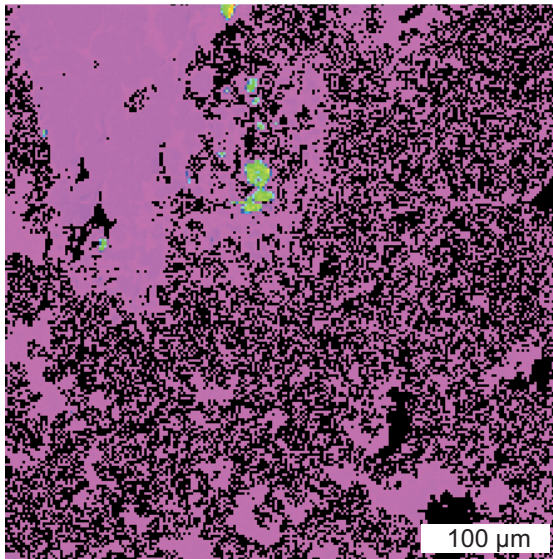




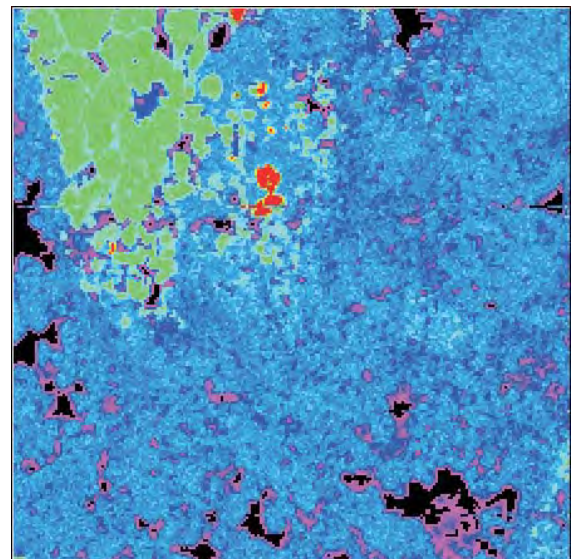
Ttn12-inner-3; EMP element map F



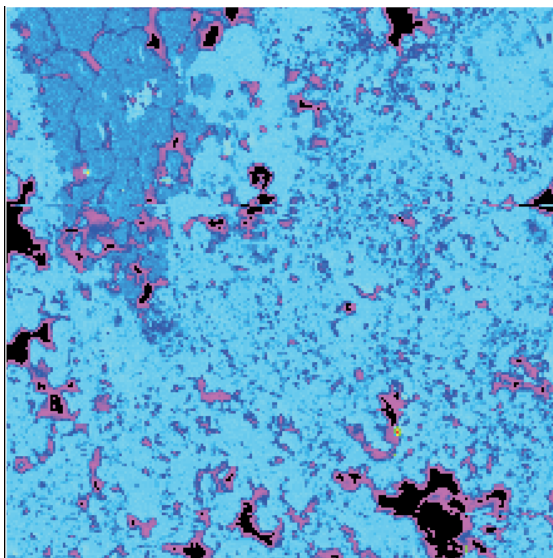
Ttn12-inner-3; EMP element map Fe



Ttn12-outer-2; EMP element map Al



Ttn12-outer-2; EMP element map Ca

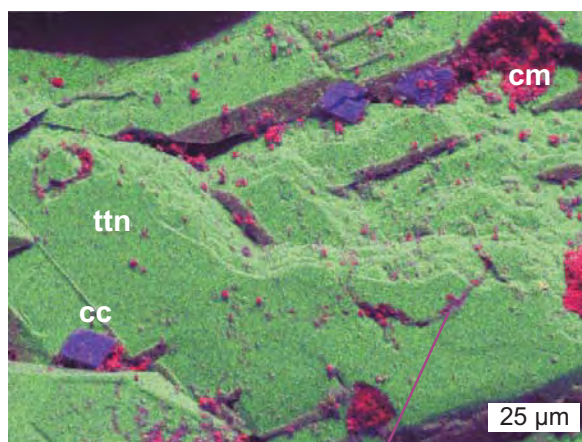


Ttn12-outer-2; EMP element map Si

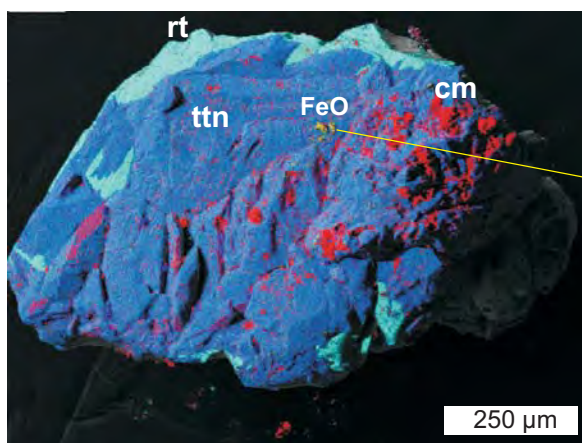


here, we face a problem to identify the minerals  
solution: quantitative analyses

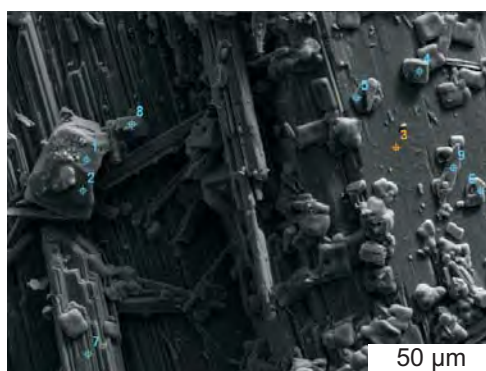
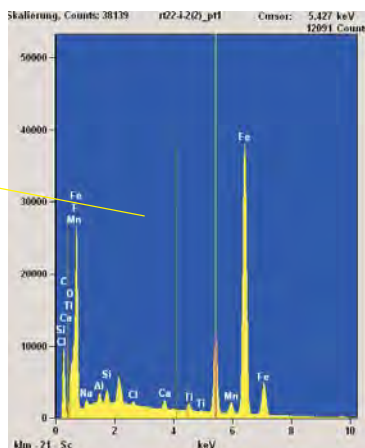




RT22-inner-detail some halite

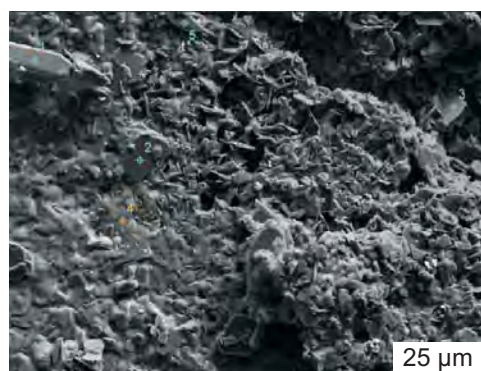


RT22-inner-2



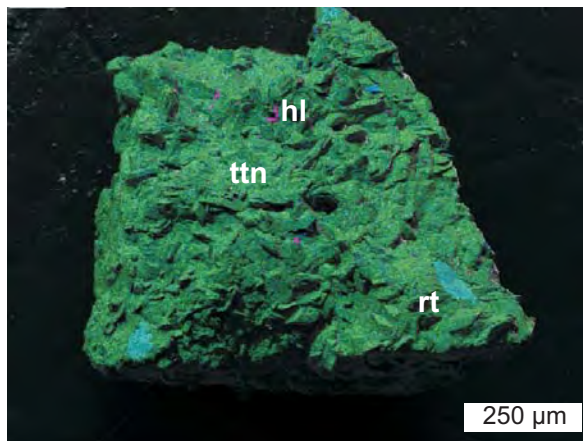
RT22-outer

mainly wollastonite, some calcite,  
new wollastonite and corundum

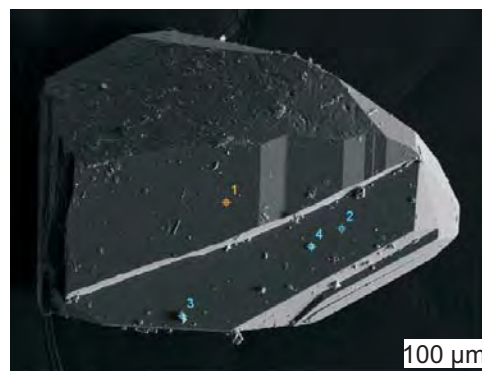


RT22-outer

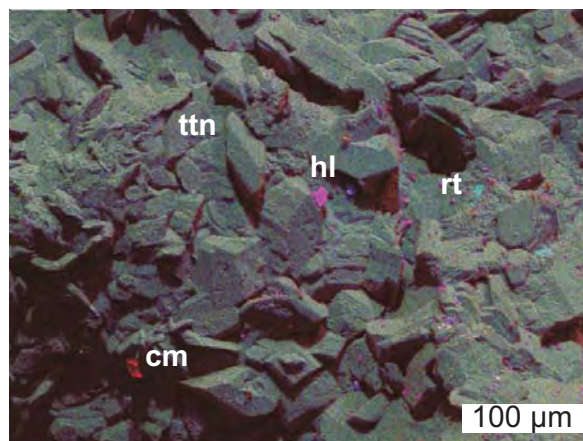
mainly corundum and halite crust



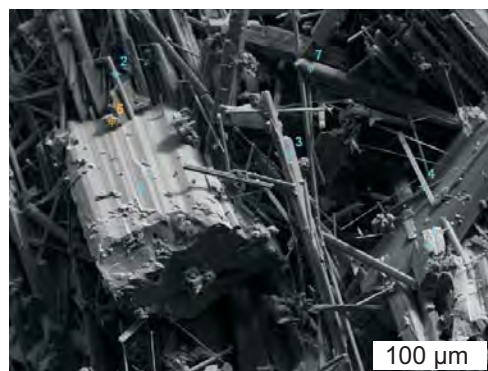
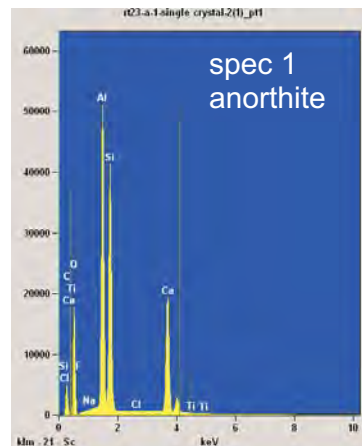
RT23-inner-2



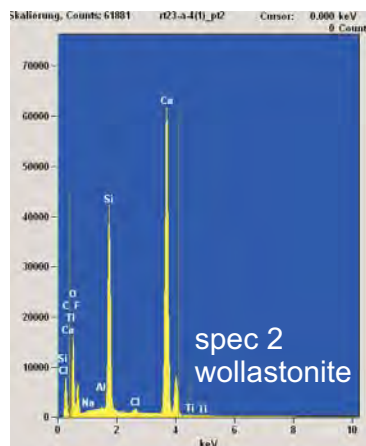
RT23-outer single-crystal anorthite



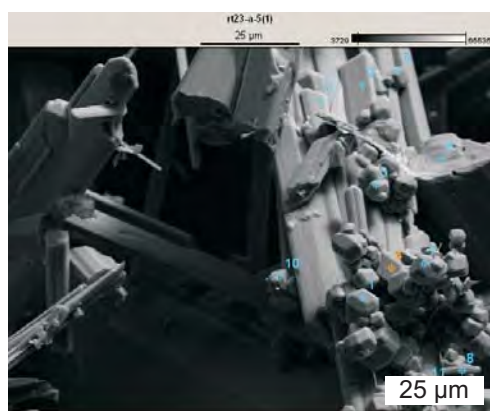
RT23-inner-1



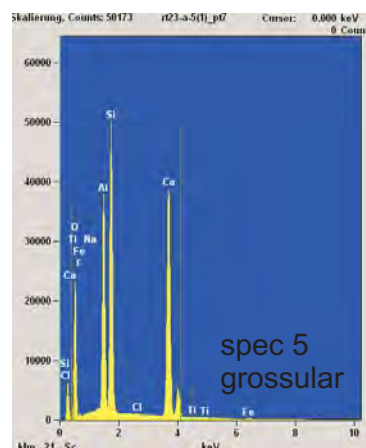
RT23-outer-4



mainly wollastonite and new grown  
wollastonite fibres 25 µm

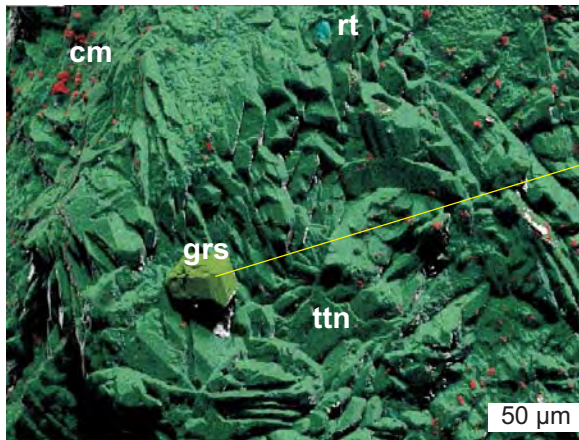


RT23-outer-5 grossular on wollastonite

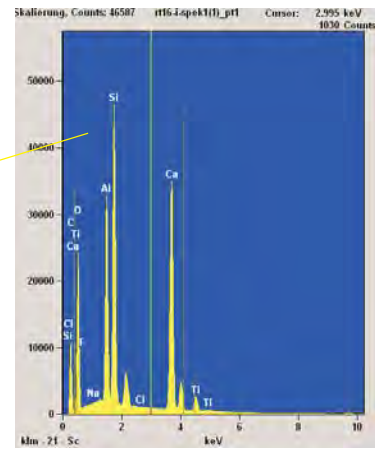


Appendix Figure 1; page 16;  
RT23 (30 days; F)

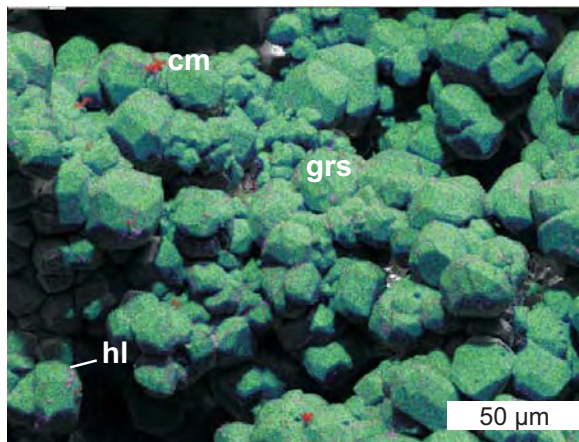




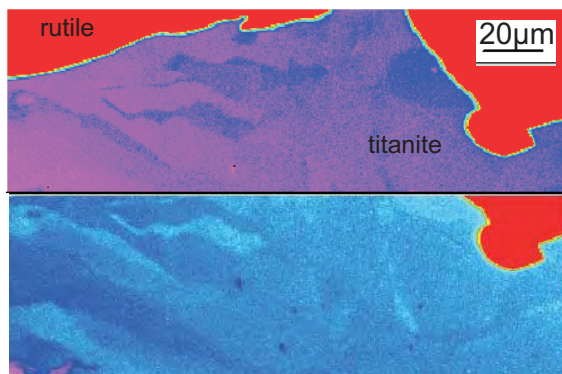
RT16-inner



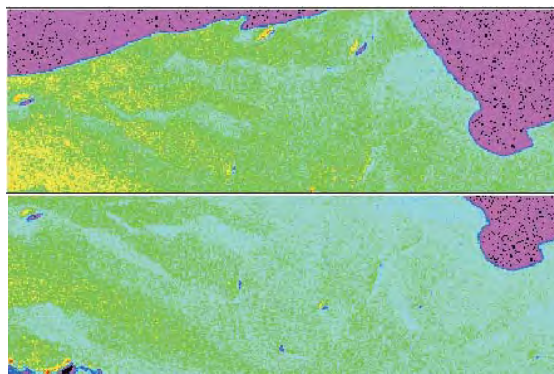
The grossular spectrum shows some Ti



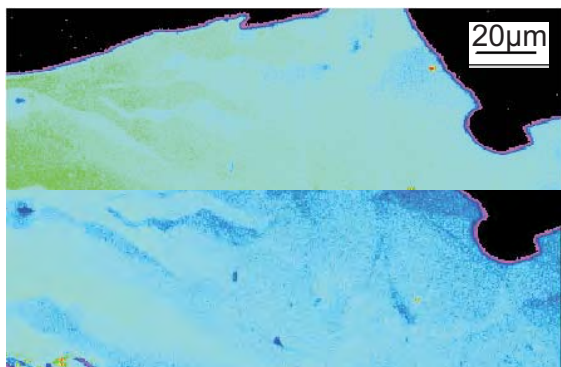
RT16-outer



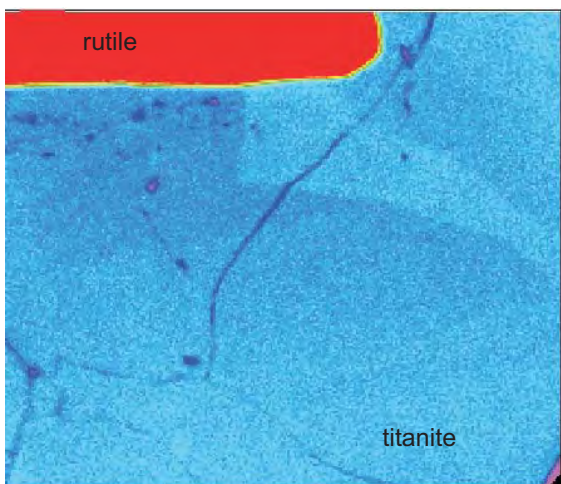
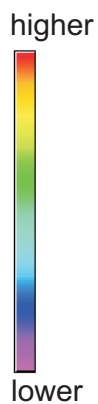
RT17-inner; EMP element map Ti



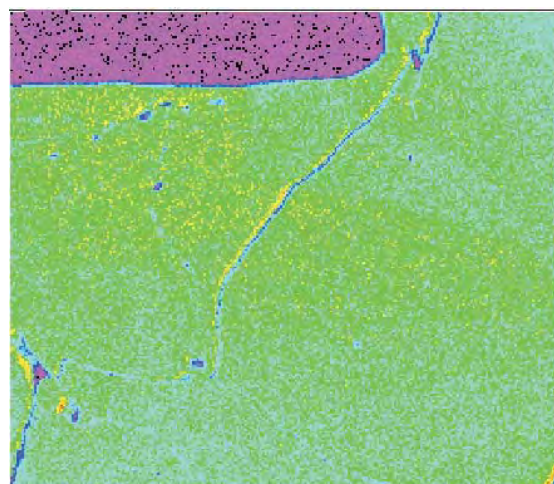
RT17-inner; EMP element map F



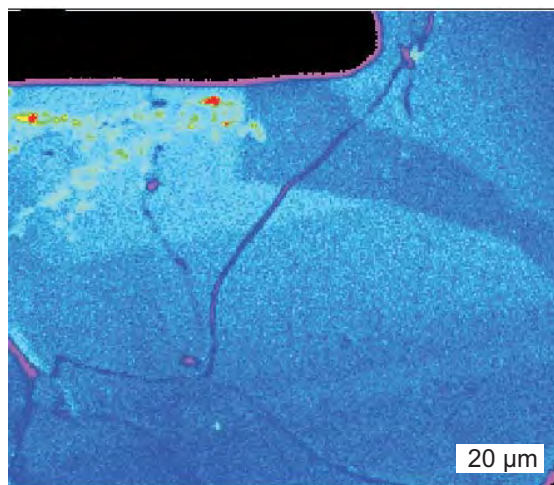
RT17-inner; EMP element map Al



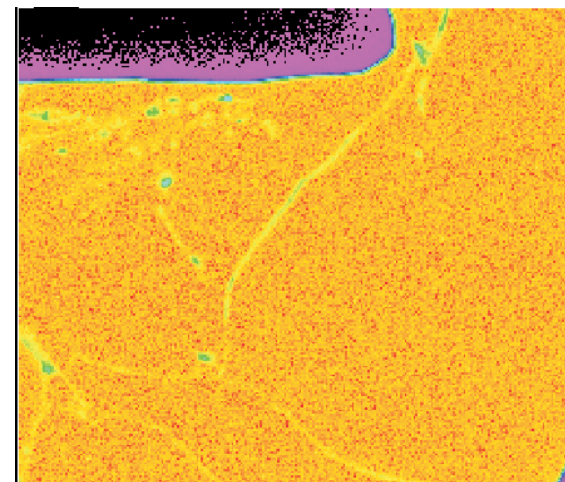
RT17-inner; EMP element map Ti



RT17-inner; EMP element map F

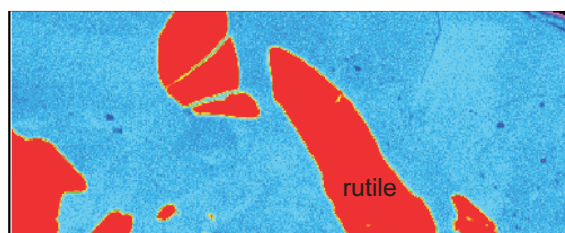


RT17-inner; EMP element map Al

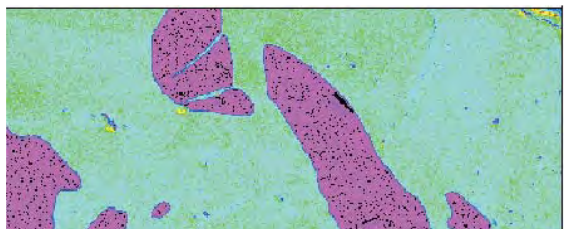


RT17-inner; EMP element map Ca

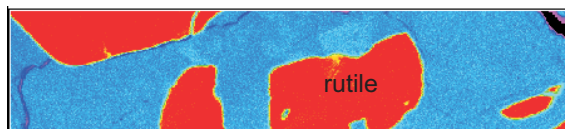




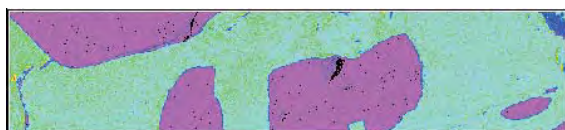
RT17-inner; EMP element map Ti



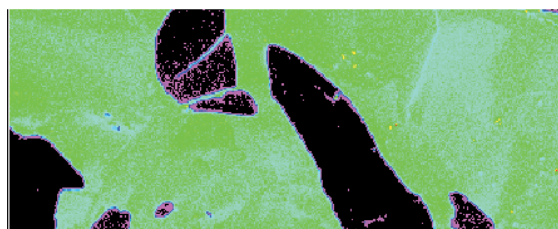
RT17-inner; EMP element map F



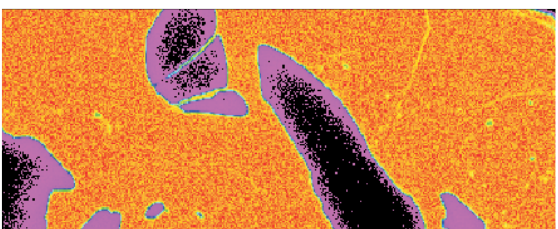
RT17-inner; EMP element map Ti



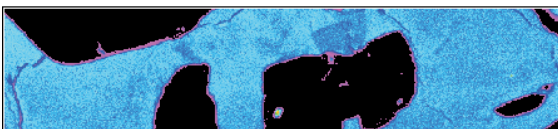
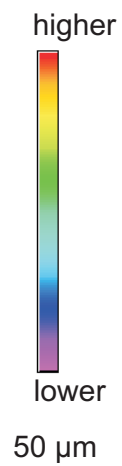
RT17-inner; EMP element map F



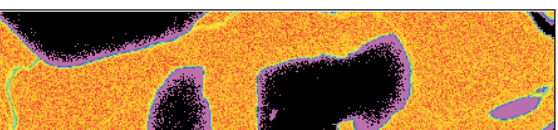
RT17-inner; EMP element map Al



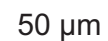
RT17-inner; EMP element map Ca; note the effect of Ca fluorescence in the rt

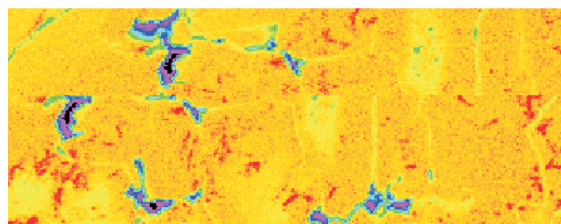


RT17-inner; EMP element map Al

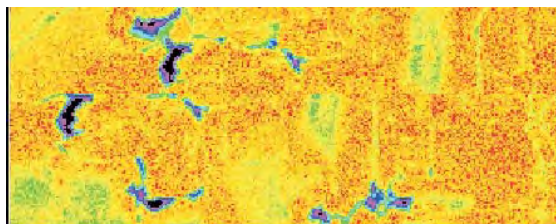


RT17-inner; EMP element map Ca; note the effect of Ca fluorescence in the rt



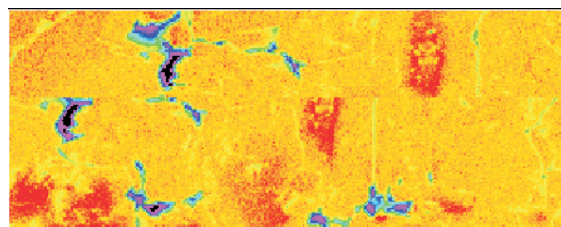


RT17-outer; plagioclase  
EMP element map Al

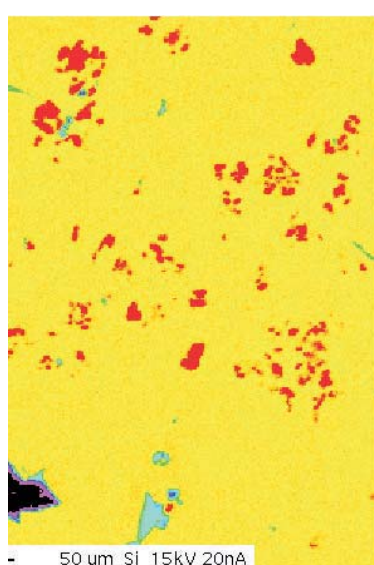
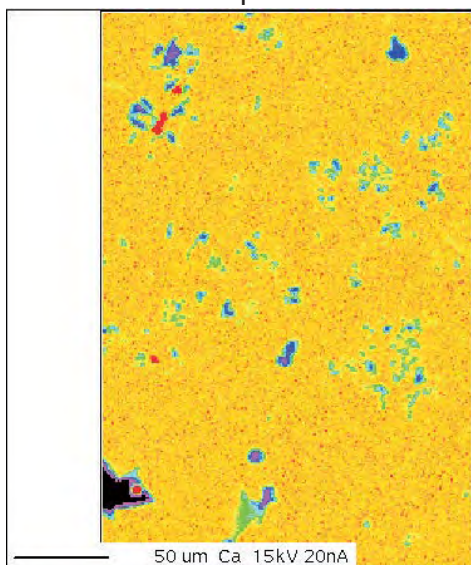


RT17-outer; plagioclase  
EMP element map Ca

50  $\mu\text{m}$

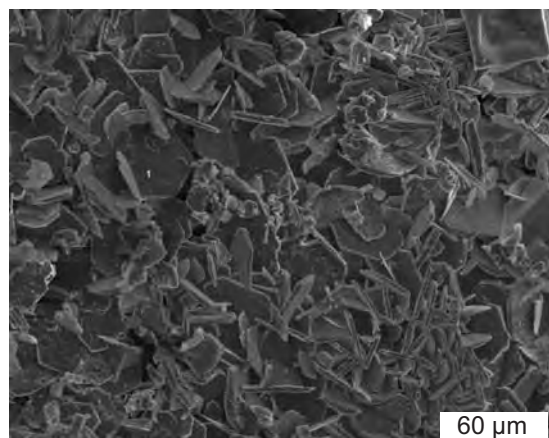


RT17-outer; plagioclase  
EMP element map Si

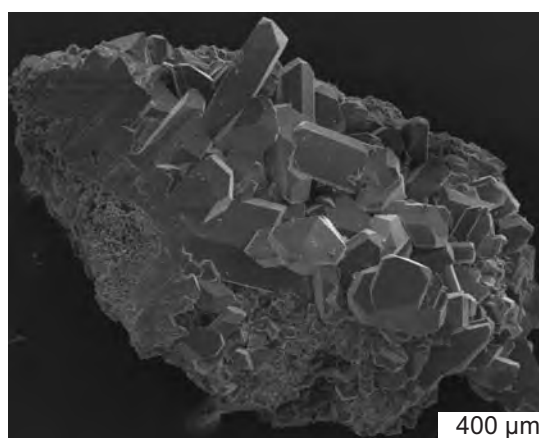


high  
low

RT17-outer; grossular garnet; EMP element maps Ca - Si

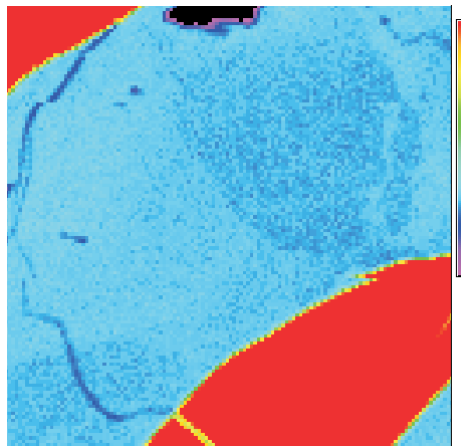
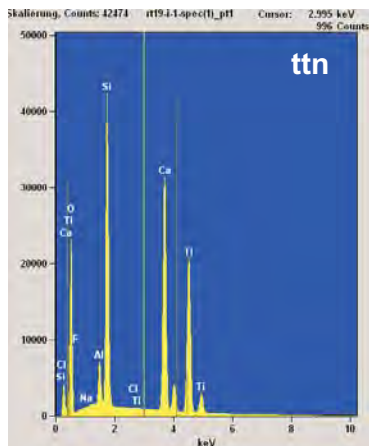


RT17-outer; SEM image,  
corundum (and some halite)

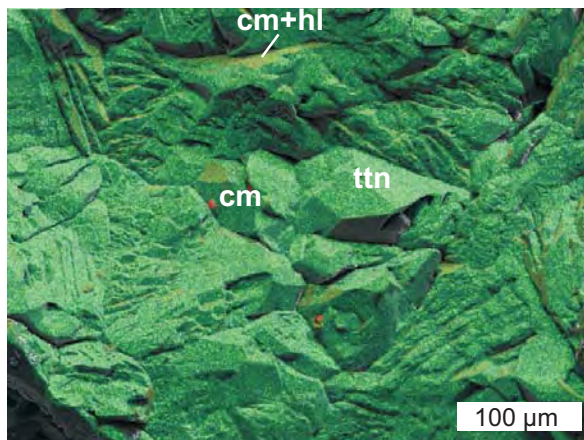


RT17-outer; SEM image, plagioclase

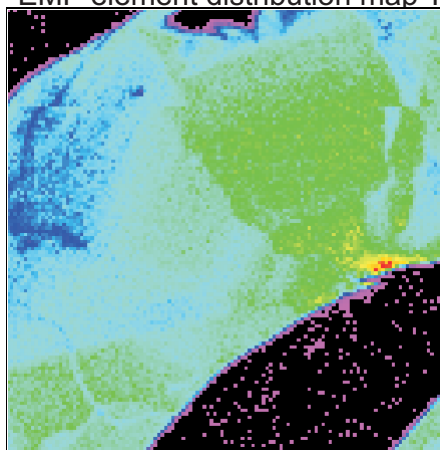




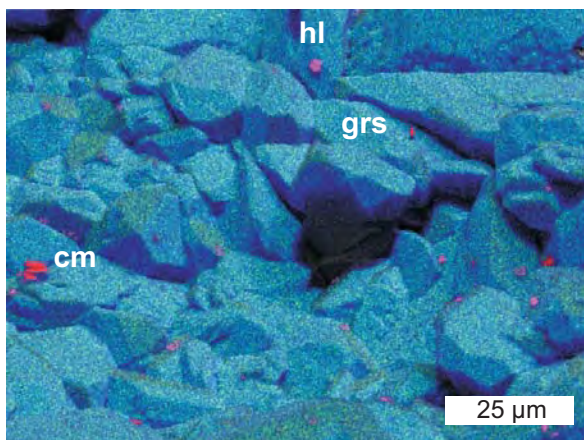
RT19-inner:  
EMP element distribution map Ti



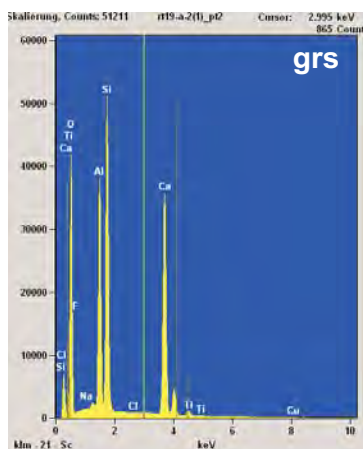
RT19-inner



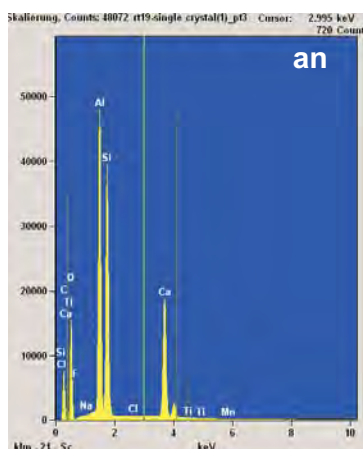
RT19-inner:  
EMP element distribution map Al

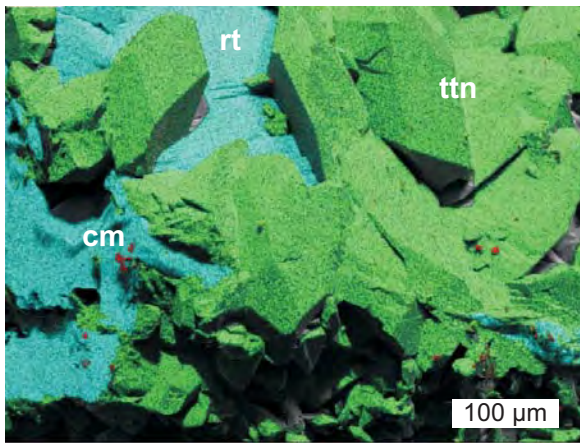


RT19-outer-1

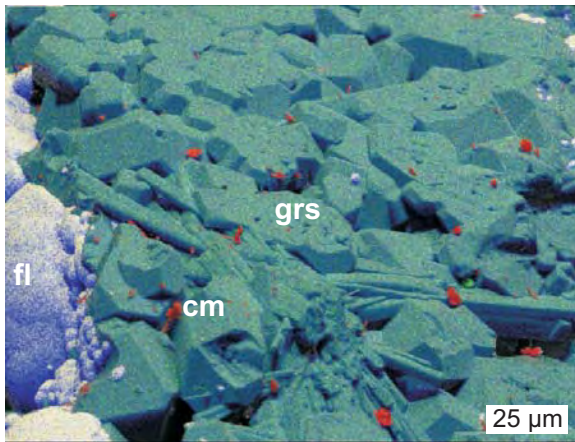


RT19-outer-2 solitary anorthite

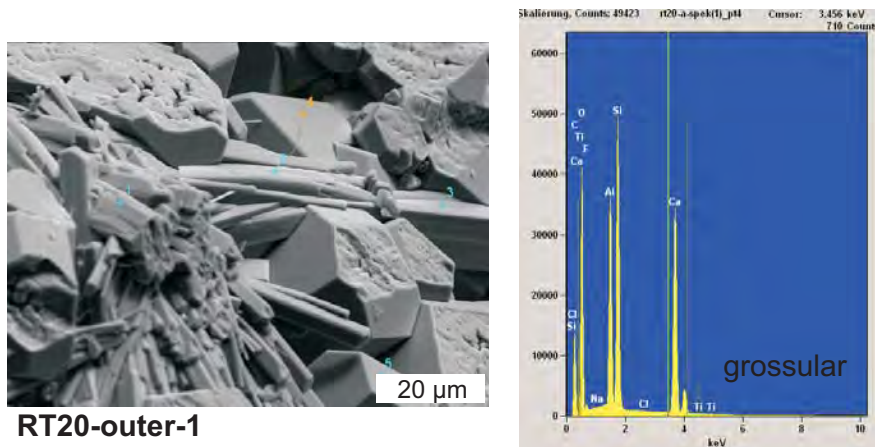




RT20-inner-1



RT20-outer-1



RT20-outer-1

