Sample Memo Report

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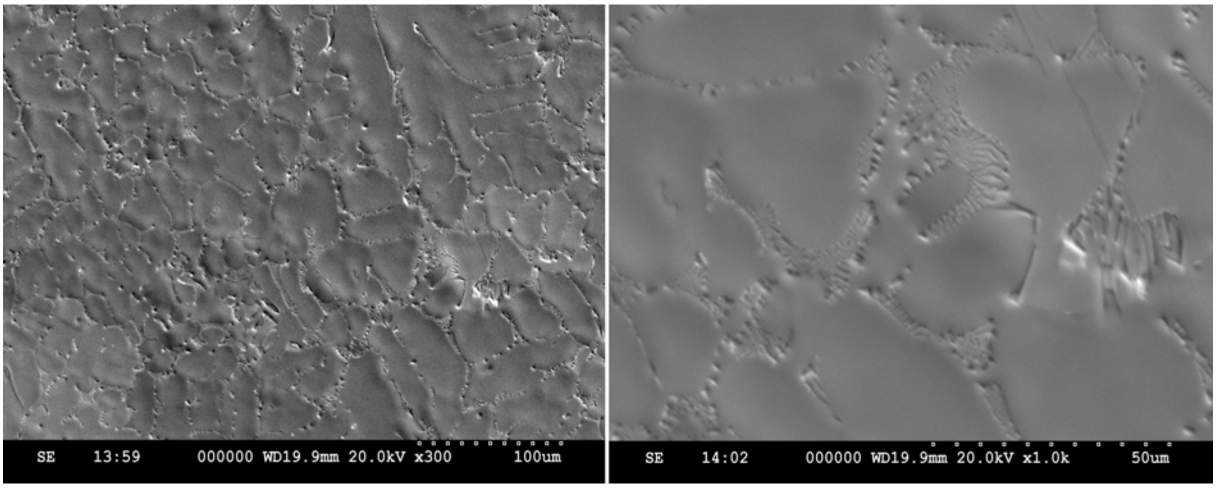
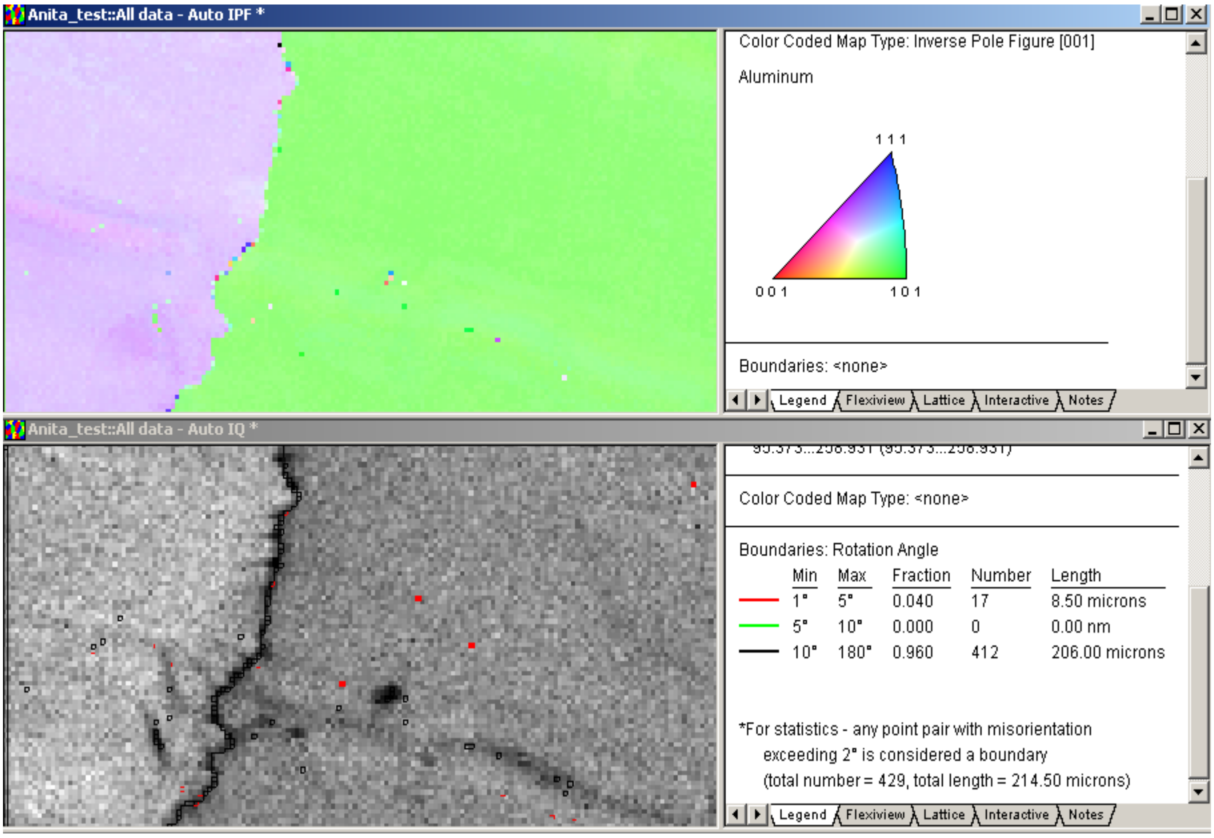
From: Yingda Yu

Subject: EBSD sample preparation test

The present treatment condition is quite suitable for EBSD sample preparation, as shown in the below SEM macrographs at x30 and x1000 magnifications from the sample central region.



A representative EBSD scan from one grain boundary (GB) area is shown in the below, where two grains are close to Al [-111] and [011] orientations.



Color Coded Map Type: Inverse Pole Figure [001]

Aluminum

Boundaries: <none>

Color Coded Map Type: <none>

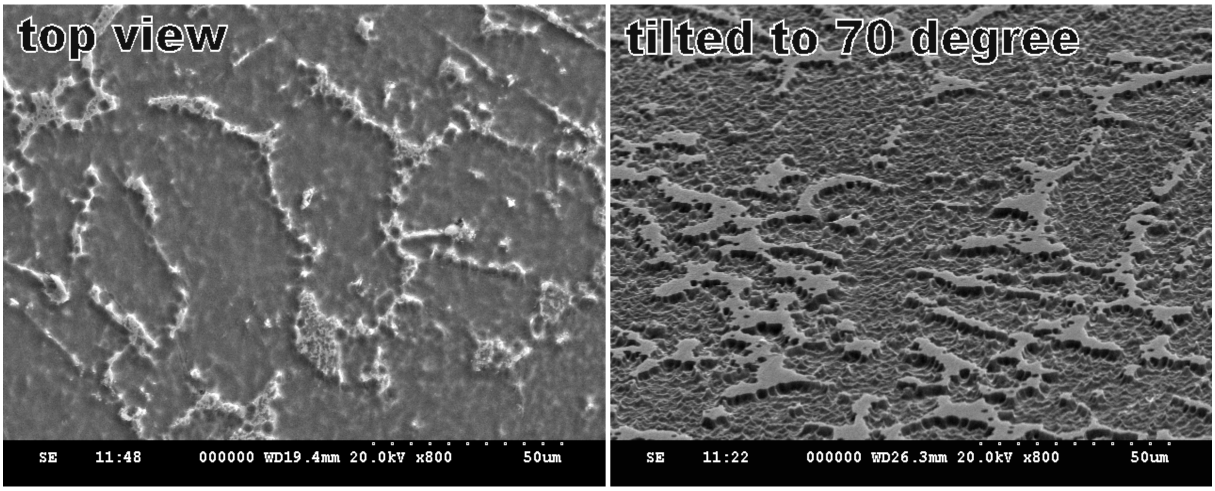
Boundaries: Rotation Angle

	Min	Max	Fraction	Number	Length
🟥	1°	5°	0.040	17	8.50 microns
🟩	5°	10°	0.000	0	0.00 nm
⬛	10°	180°	0.960	412	206.00 microns

*For statistics - any point pair with misorientation exceeding 2° is considered a boundary (total number = 429, total length = 214.50 microns)

Only a tiny problem is grain boundary is not as smooth as inside grains, which caused a little bit EBSD indexing uncertain around GBs.

Since EBSD analysis is configured at 70 degree, an unsmooth sample surface will cause serious EBSD background subtraction problem then result uncertain EBSD indexing. One example of such effect is performed from the same unsmooth edge region as shown in the below SEM micrographs with magnification at x800.



The corresponding EBSD test is shown in the below figure. Even though EBSD pattern could still be obtained from the relevant smooth region, the unsmooth part contributed a black uncertain background, i.e. the large area EBSD scan could not be carried out from such a region.