

SEM - Zeiss EVO 60

Date: 2019-09-17

Tags: Training 01/07/2019Synth SEM 28/08/2019Synth

Created by: James Bird

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Goal : Explore whether freezing of dropcast suspension during drying process has impeded chance of imaging particles to acquire a size distribution

Procedure :

- Samples (see Experiment SEM stub preparation for PSD II) loaded into SEM chamber and vacuum acquired
- 5,10,15 or 20 kV accelerating voltage set for electron beam
- WD in range 5.5-13 mm
- Everhart-Thornley secondary electron (SE) detector and back-scatter electron (BSE) detector employed

Results :

| Sample | Filename prefix |
|--|----------------------|
| Sediment from 01/07/2019 synthesis - higher concentration samples | 03-07 MAX |
| 'High quality' MXene product from 01/07/2019 synthesis - higher concentration sample | 03-07 MXene |
| MXene product from 28/08/2019 synthesis - higher concentration sample | 30-08 MXene |
| MXene product from 28/08/2019 synthesis - lower concentration sample | 30-08 MXene low conc |

Struggled to get good imaging conditions and initially failed to understand contrast and brightness optimisation. Although some particles appear to be MXene, contrast and imaging conditions are far from optimum to distinguish them from reliably from substrate. Again, larger freeze-cast structures present. Use of back-scatter detector showed reasonable contrast between sample and substrate, but MXene vs MAX phase distinction unclear at low, 600 x magnification.

Attached files

03-07-MAX0.tif

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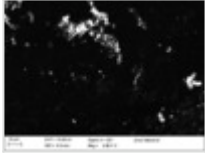
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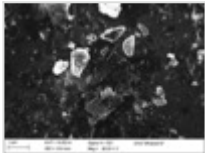
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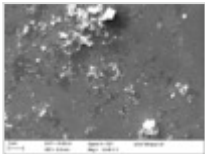
03-07-MXene0.tif

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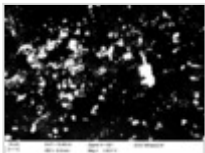
03-07-MXene1.tif

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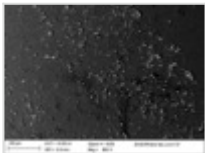
03-07-MXene2.tif

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30-08-MXene-low-conc1.tif

sha256: 66be36bdb5188684c7b42ac383772f7c07d9903a4fa5c1f03bbb8f80e5172367



30-08-MXene-low-conc2.tif

sha256: 54b955db1bf71a2a9085dcda307f5f074f16c45fdeeb7e4984055342e9b10370

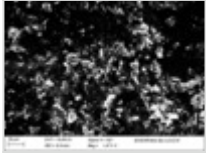
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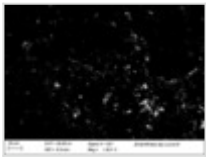
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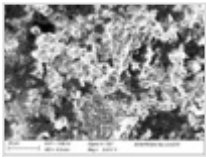
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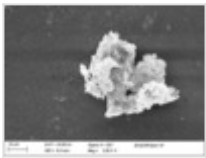
30-08-MXene-low-conc4.tif

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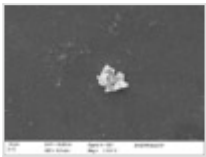
30-08-MXene1.tif

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30-08-MXene2.tif

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30-08-MXene3.tif

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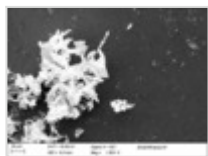
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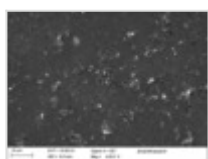
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30-08-MXene5.tif

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Unique eLabID: 20221007-936a375d9fb158ec52e4b790bdeecc0858e75d1f

Link: <https://frankel-elab.manchester.ac.uk/experiments.php?mode=view&id=14>