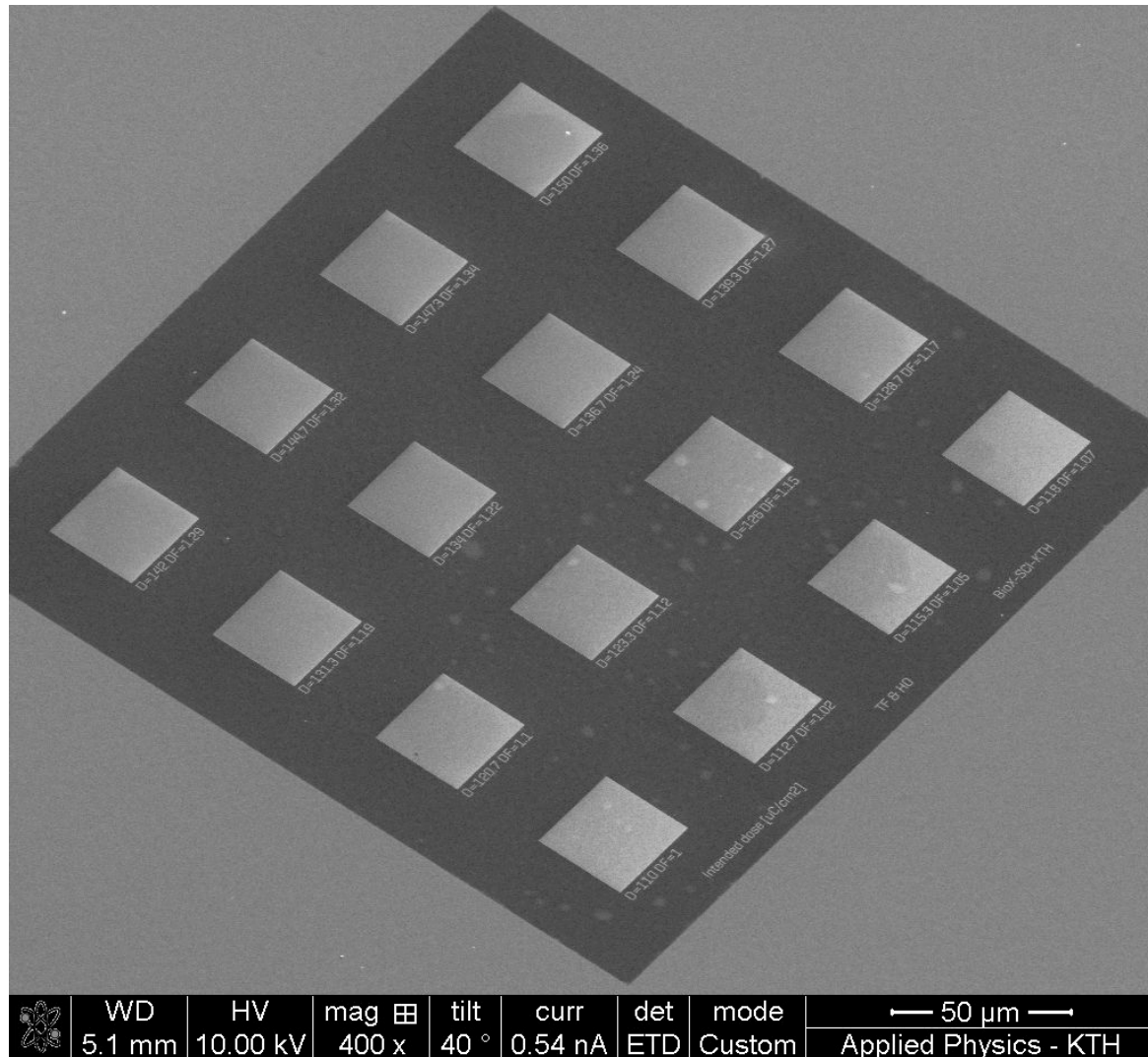


Dose tests on 170 nm of CSAR-6200.09 on SiN-membranes with 10 nm Cr and 5 nm Au



An array of 16 squares is drawn on the membrane, all with different doses, set to vary between $110 \mu\text{C}/\text{cm}^2$ to $150 \mu\text{C}/\text{cm}^2$. This as to determine the clearing dose of the resist. Doses are as follows, from bottom left to top right;

- Nr 1: Dose: $110 \mu\text{C}/\text{cm}^2$
- Nr 2: Dose: $112.7 \mu\text{C}/\text{cm}^2$
- Nr 3: Dose: $115.3 \mu\text{C}/\text{cm}^2$
- Nr 4: Dose: $118 \mu\text{C}/\text{cm}^2$
- Nr 5: Dose: $120.7 \mu\text{C}/\text{cm}^2$
- Nr 6: Dose: $123.3 \mu\text{C}/\text{cm}^2$
- Nr 7: Dose: $126 \mu\text{C}/\text{cm}^2$
- Nr 8: Dose: $128.7 \mu\text{C}/\text{cm}^2$
- Nr 9: Dose: $131.3 \mu\text{C}/\text{cm}^2$
- Nr 10: Dose: $134 \mu\text{C}/\text{cm}^2$
- Nr 11: Dose: $136.7 \mu\text{C}/\text{cm}^2$
- Nr 12: Dose: $139.3 \mu\text{C}/\text{cm}^2$
- Nr 13: Dose: $142 \mu\text{C}/\text{cm}^2$
- Nr 14: Dose: $144.7 \mu\text{C}/\text{cm}^2$
- Nr 15: Dose: $147.3 \mu\text{C}/\text{cm}^2$
- Nr 16: Dose: $150 \mu\text{C}/\text{cm}^2$

Settings for writing:

E-beam: Raith Voyager 50 kV

Aperture: LC30

Current: 95 pA

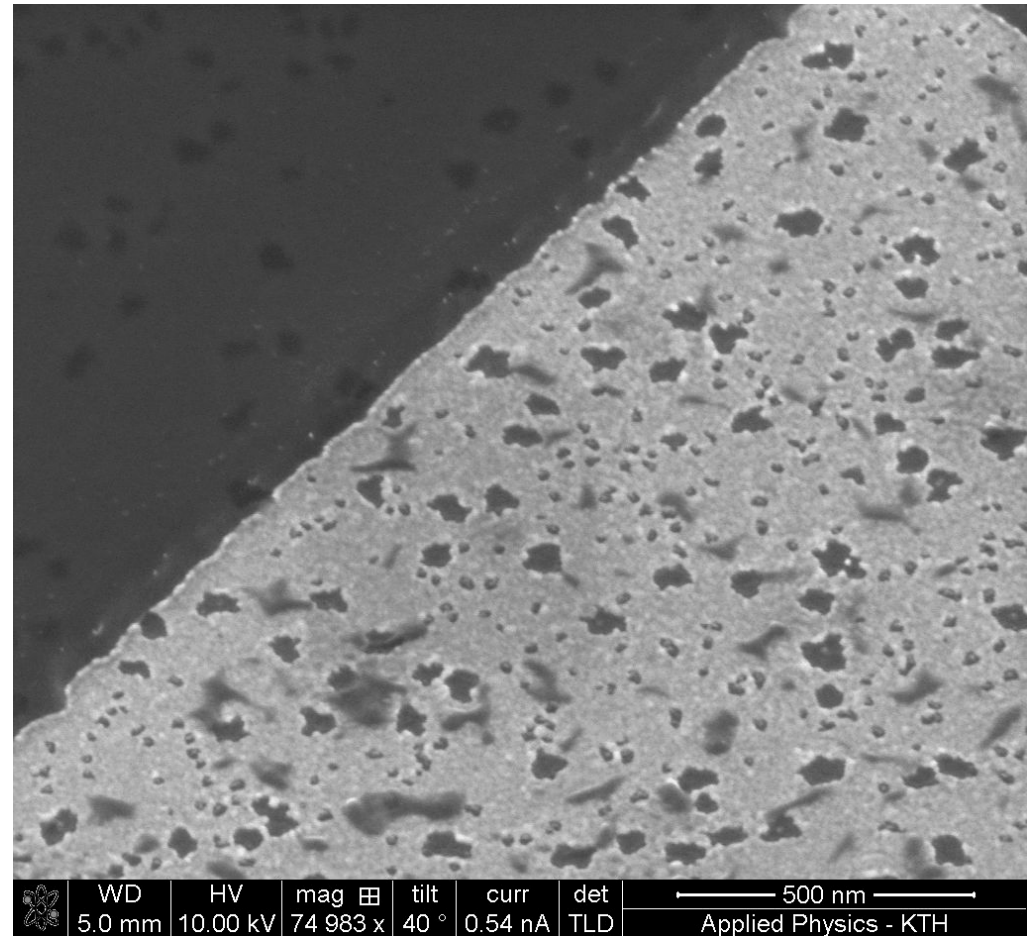
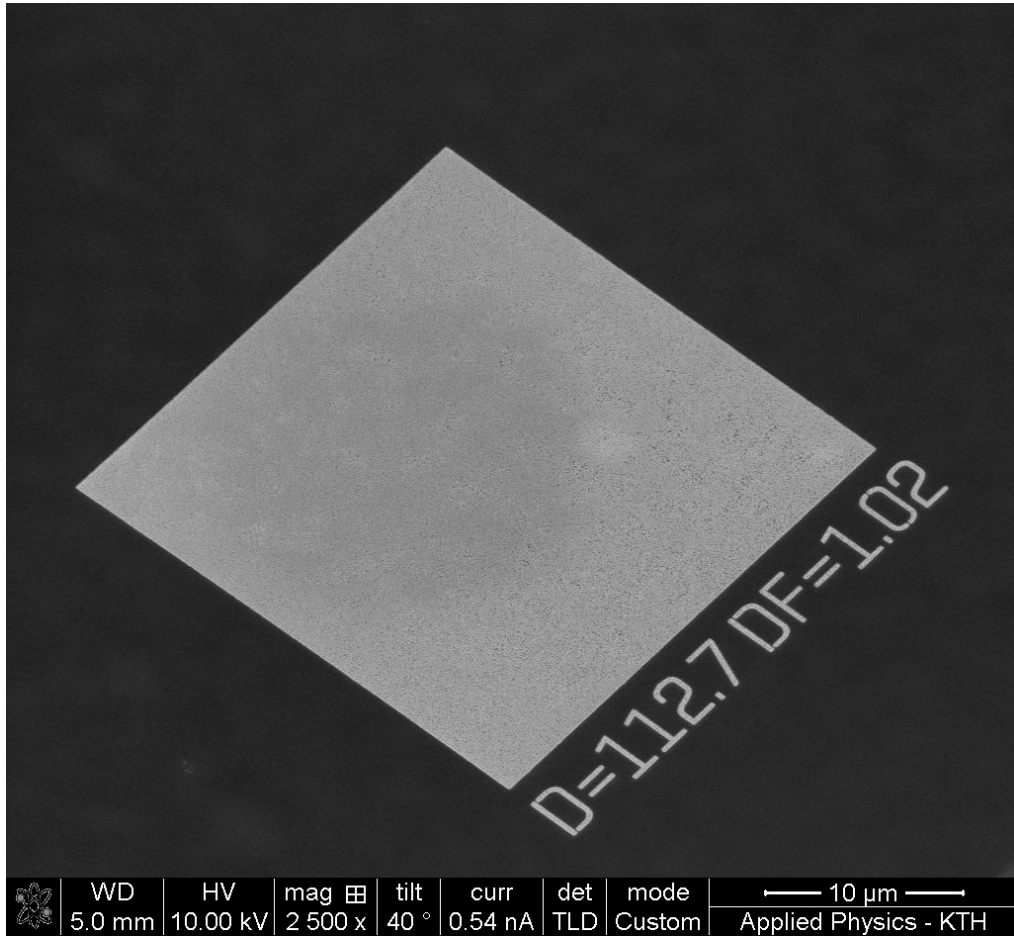
Stepsize: 10/10 nm

Samples have after exposure been cleaned with an O_2 -plasma for 15 sec (50W, 10 sccm).

Tests carried out by Hanna Ohlin and Thomas Frisk
 in August-September 2019

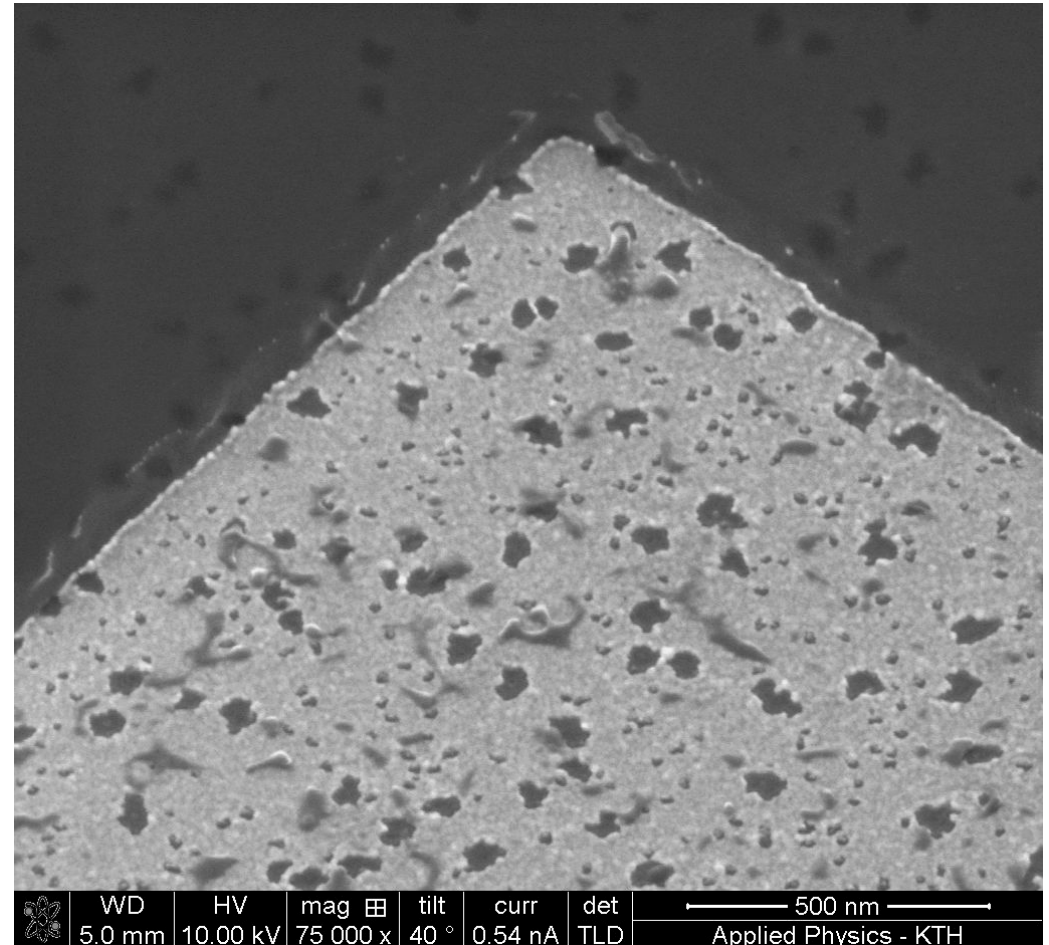
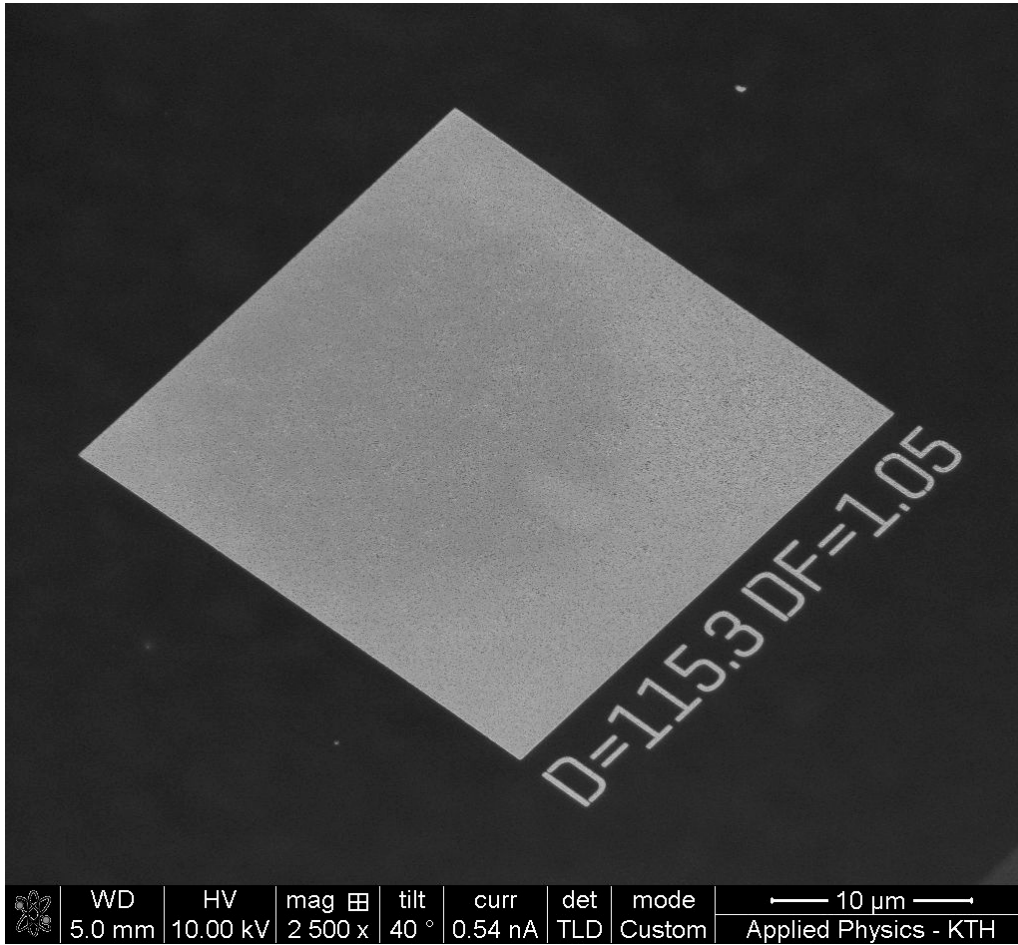
Dose 112.7 $\mu\text{C}/\text{cm}^2$

Resist residues: blurry 'blobs'
Voids in Au layer: sharp edged black 'wells'



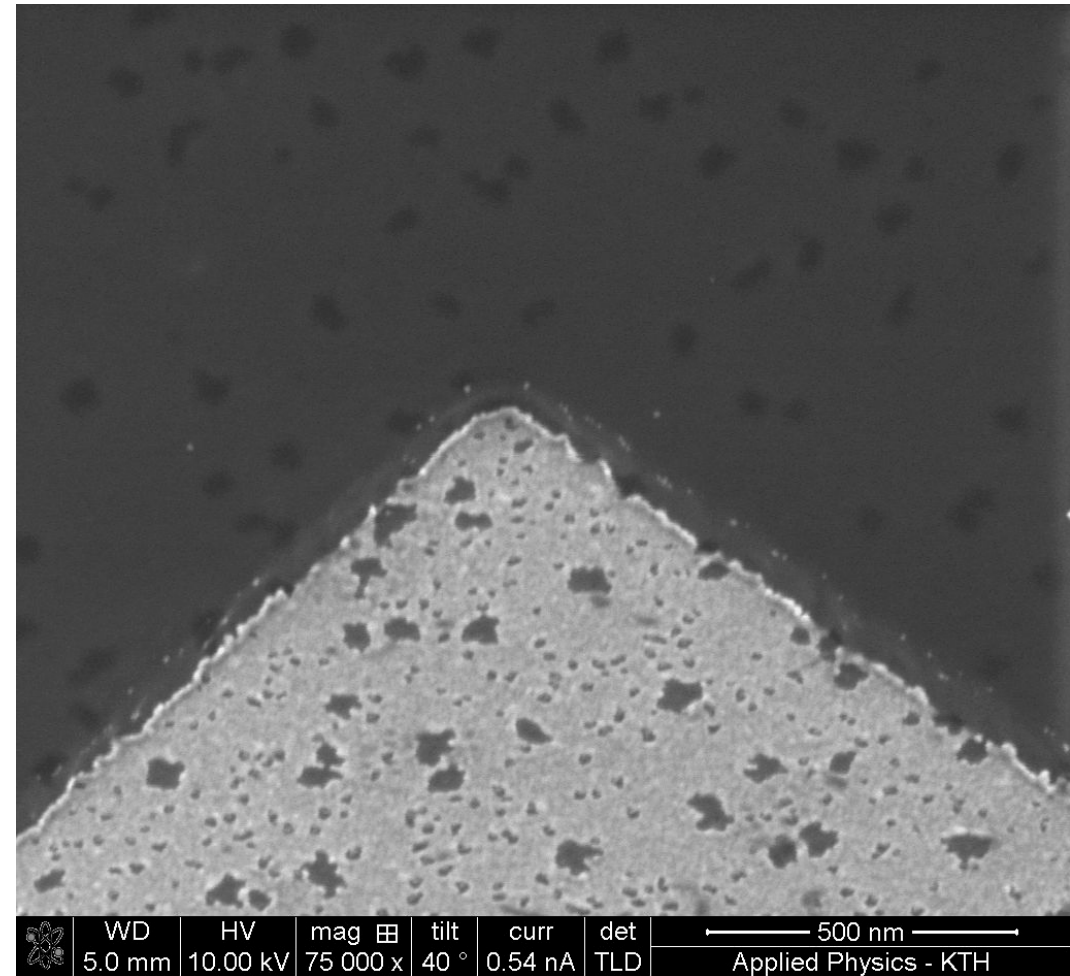
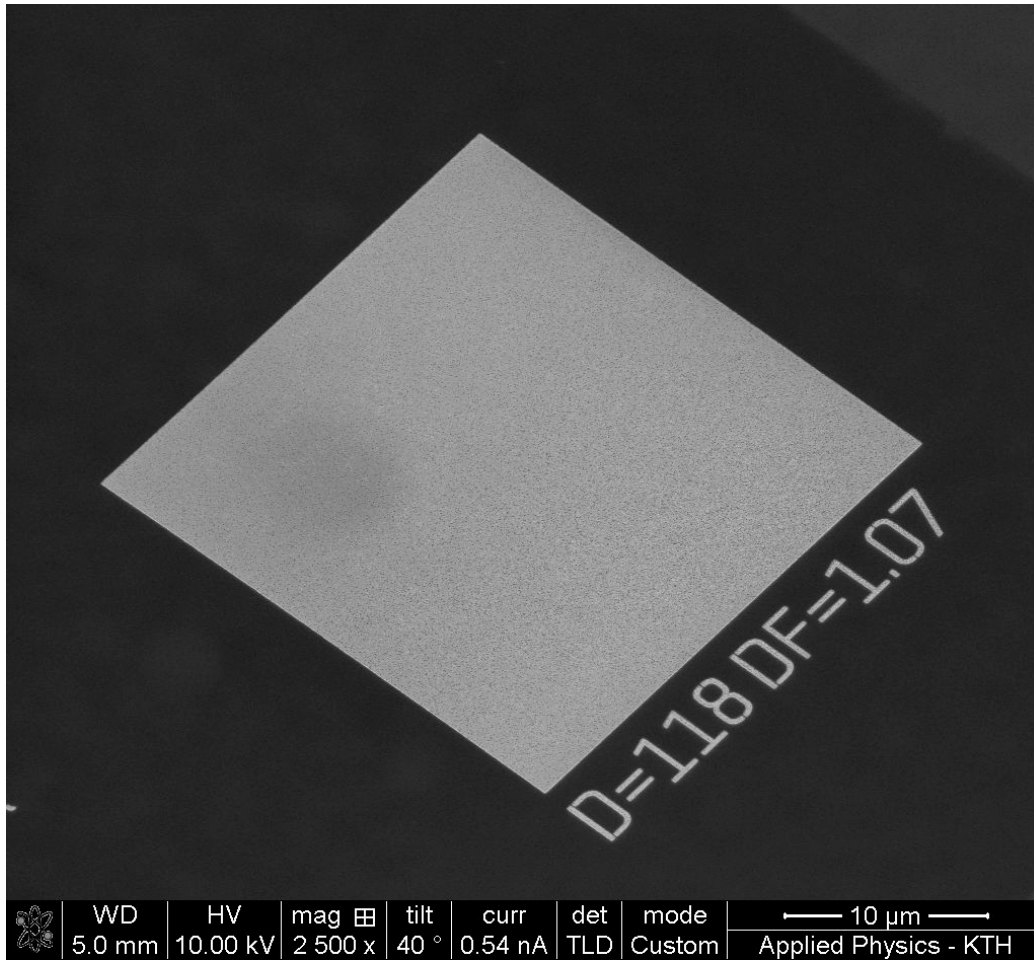
For a dose of 112.7 $\mu\text{C}/\text{cm}^2$, dose factor 1.02, there is no full clearing of the underlying resist.

Dose 115.3 $\mu\text{C}/\text{cm}^2$



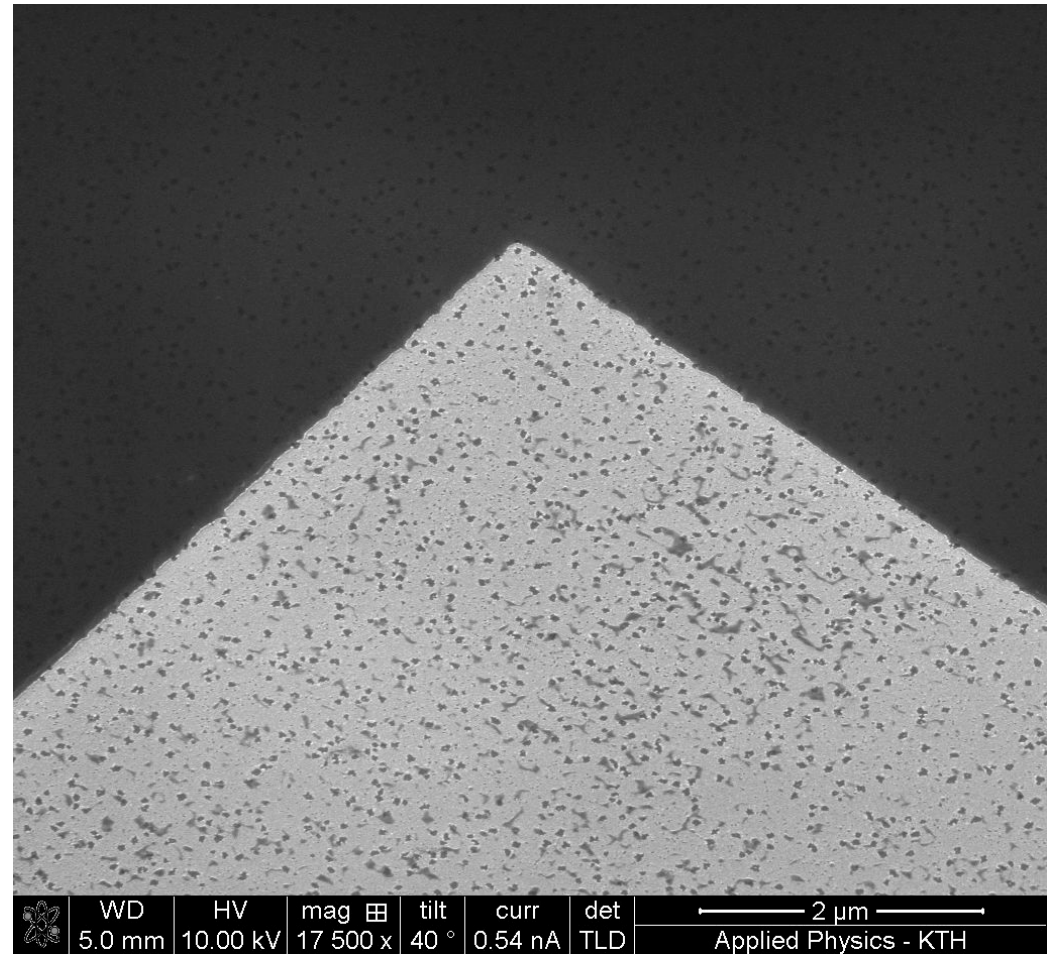
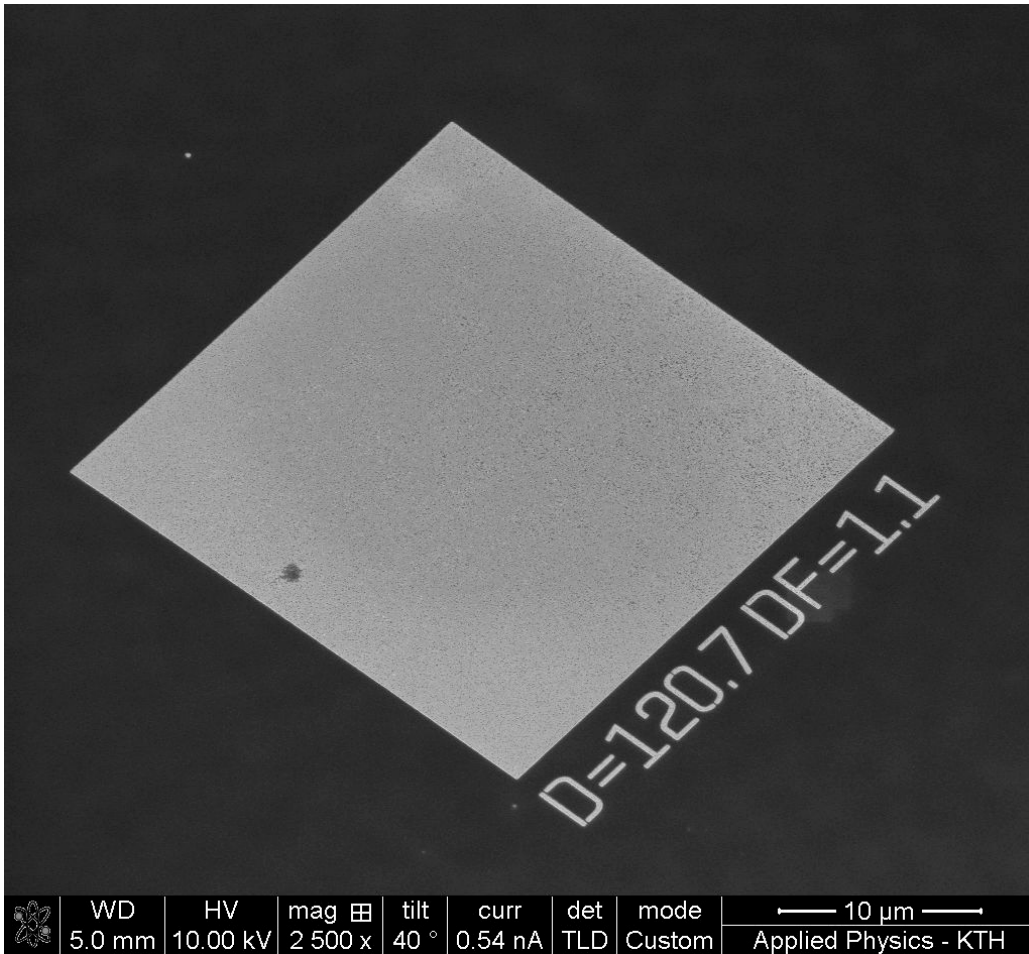
For a dose of 115.3 $\mu\text{C}/\text{cm}^2$, dose factor 1.05, there is no full clearing of the underlying resist.

Dose 118 $\mu\text{C}/\text{cm}^2$



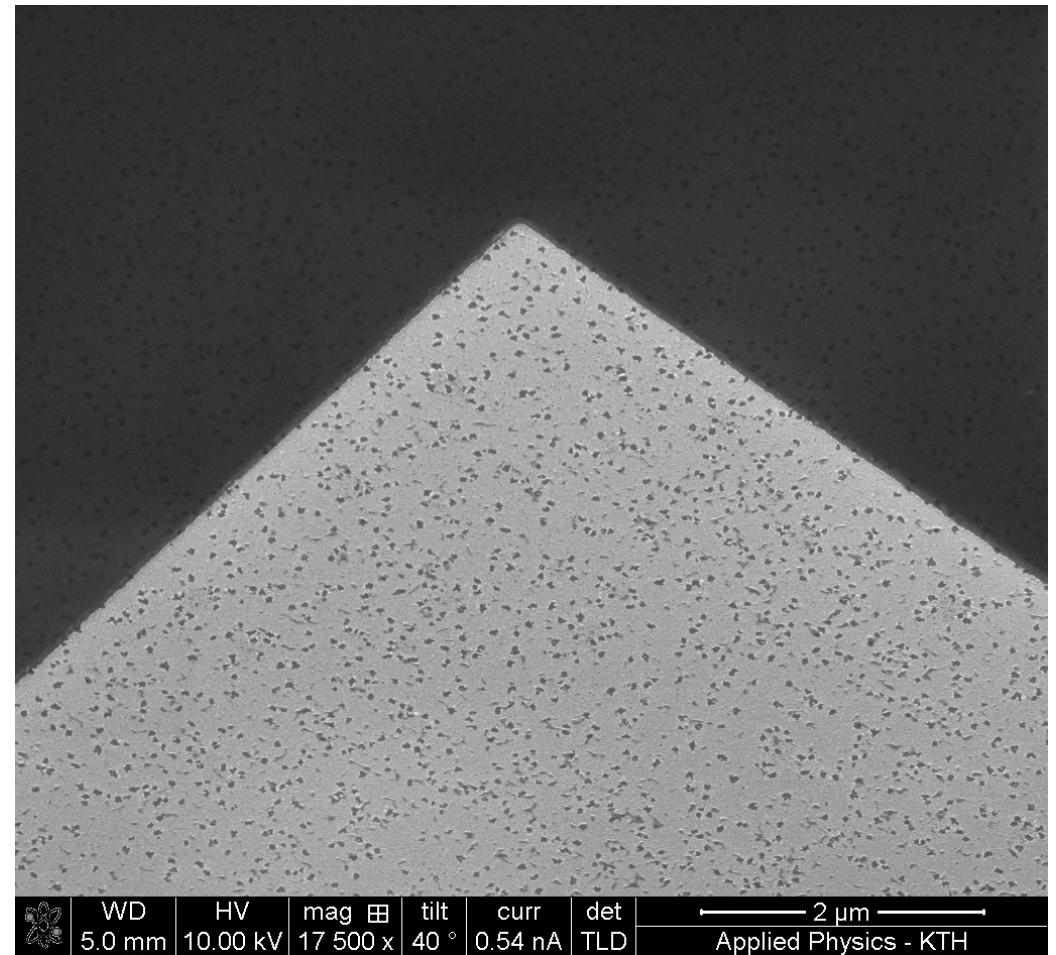
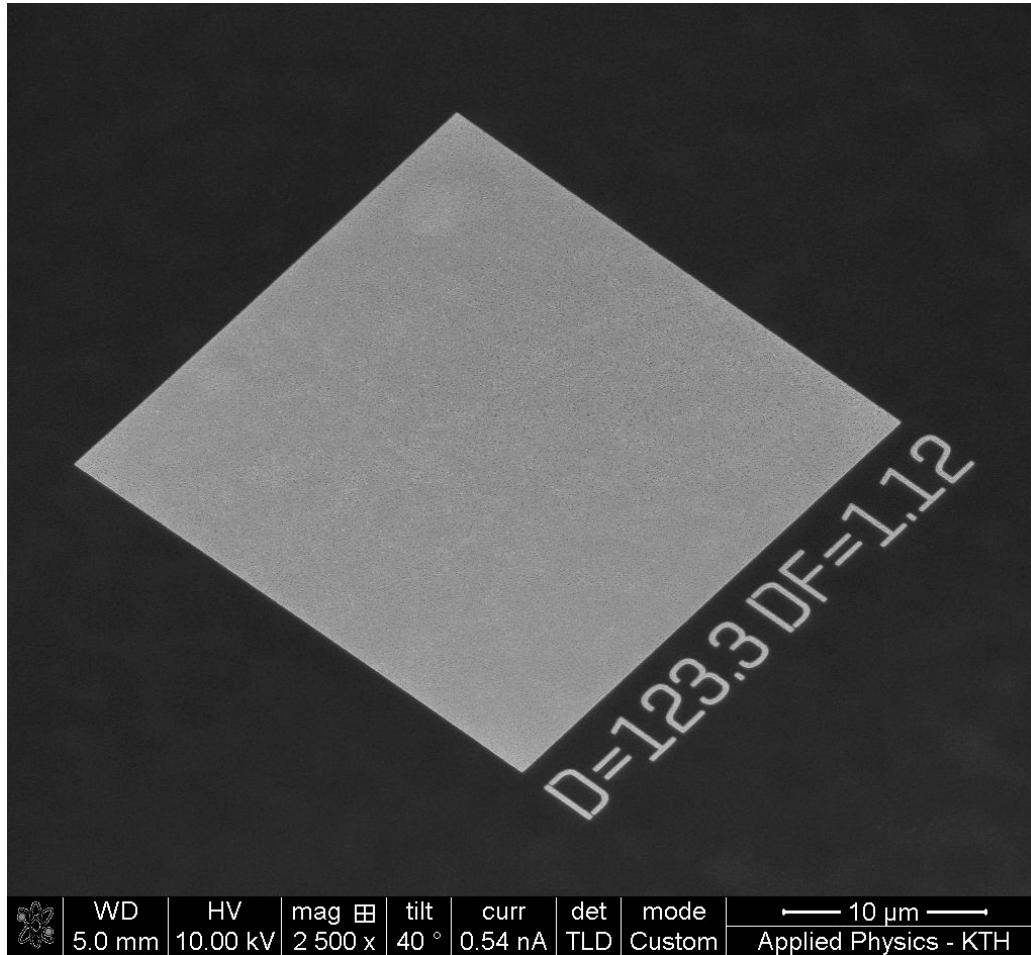
For a dose of 118 $\mu\text{C}/\text{cm}^2$, dose factor 1.07, there is no full clearing of the underlying resist. We can however see a clear tendency to clearing of resist.

Dose 120.7 $\mu\text{C}/\text{cm}^2$



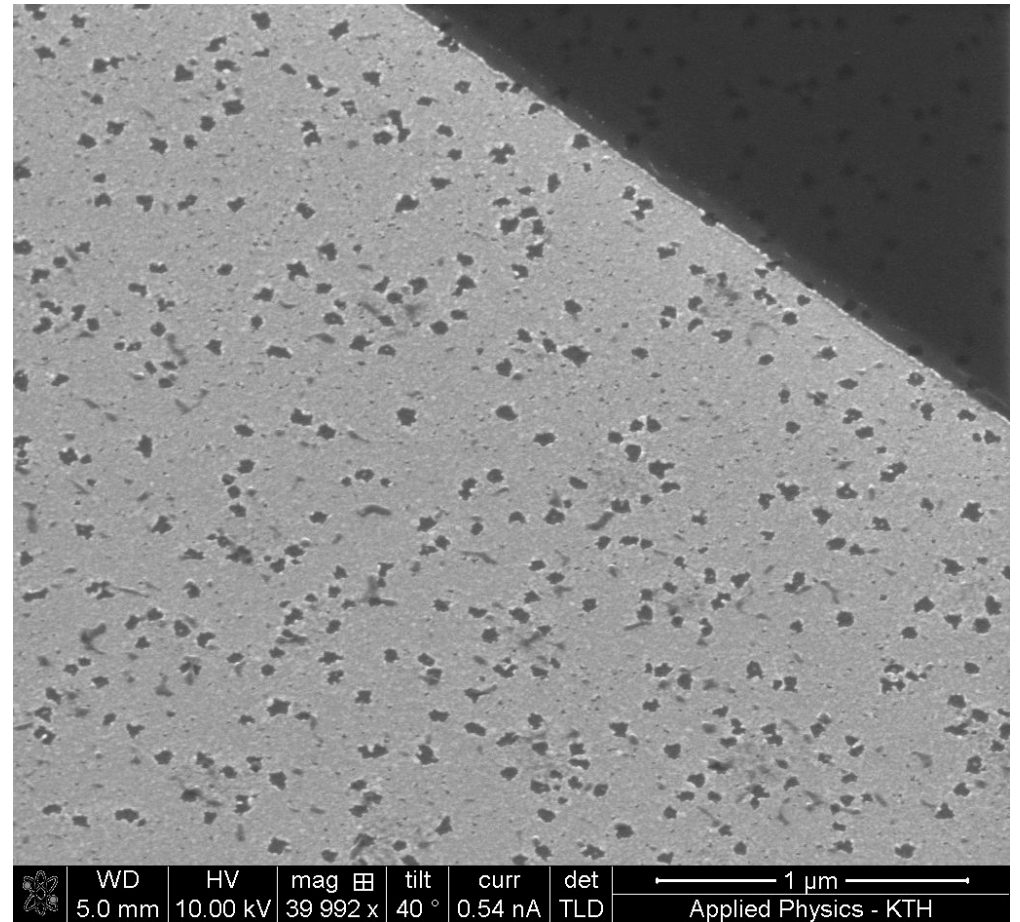
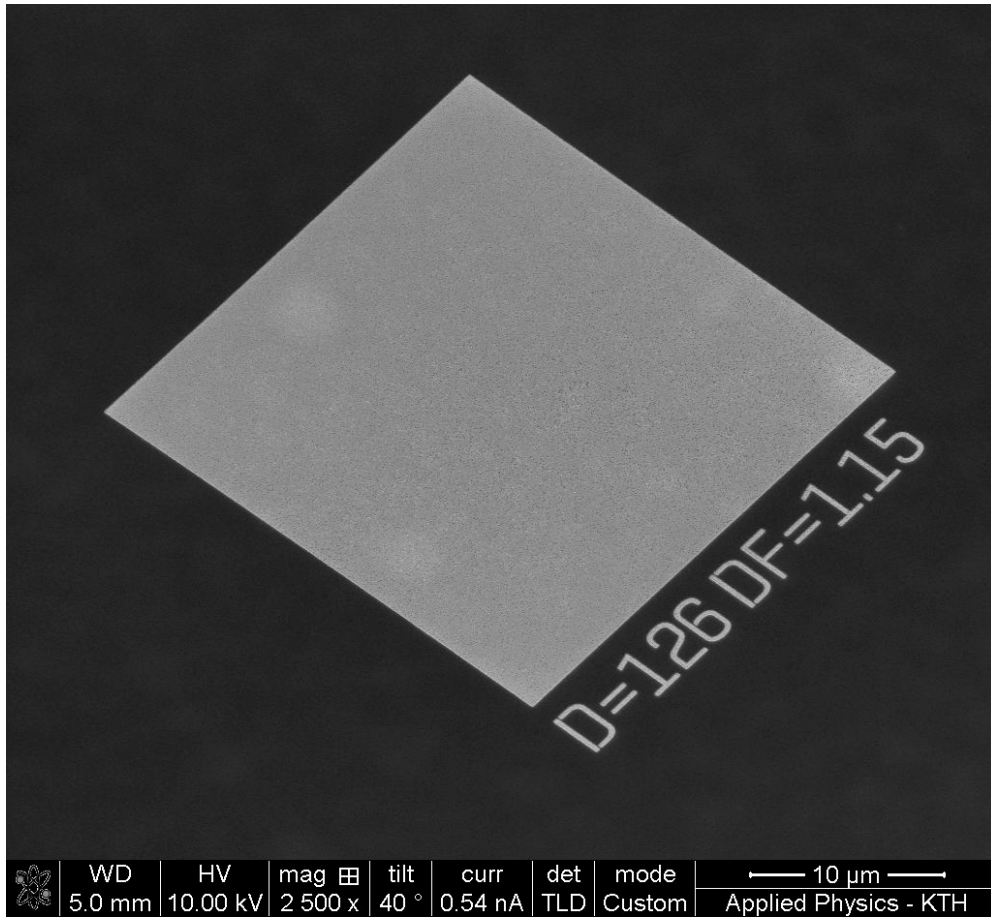
For a dose of 102.7 $\mu\text{C}/\text{cm}^2$, dose factor 1.1, there is no full clearing of the underlying resist.

Dose 123.3 $\mu\text{C}/\text{cm}^2$



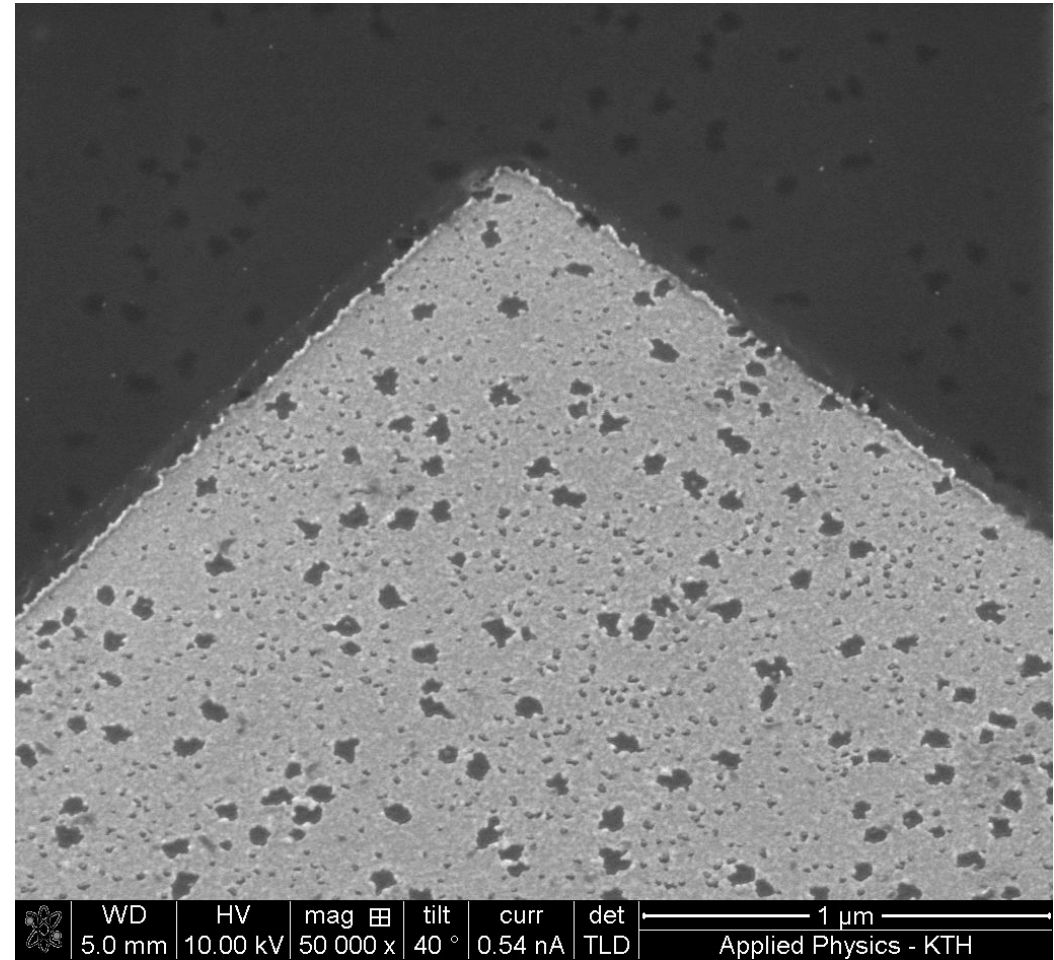
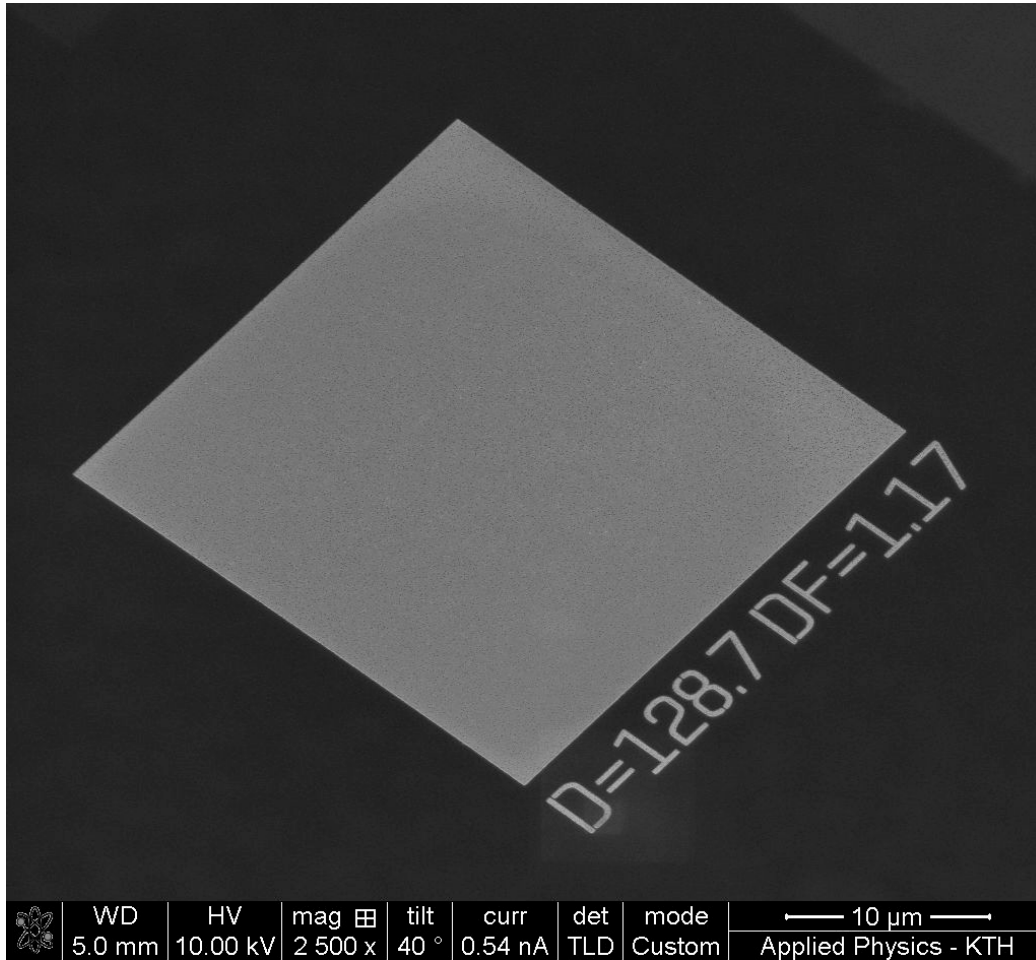
For a dose of 123.3 $\mu\text{C}/\text{cm}^2$, dose factor 1.12, there is no full clearing of the underlying resist. The amount of remaining resist is however trending towards the more scarce side.

Dose 126 $\mu\text{C}/\text{cm}^2$



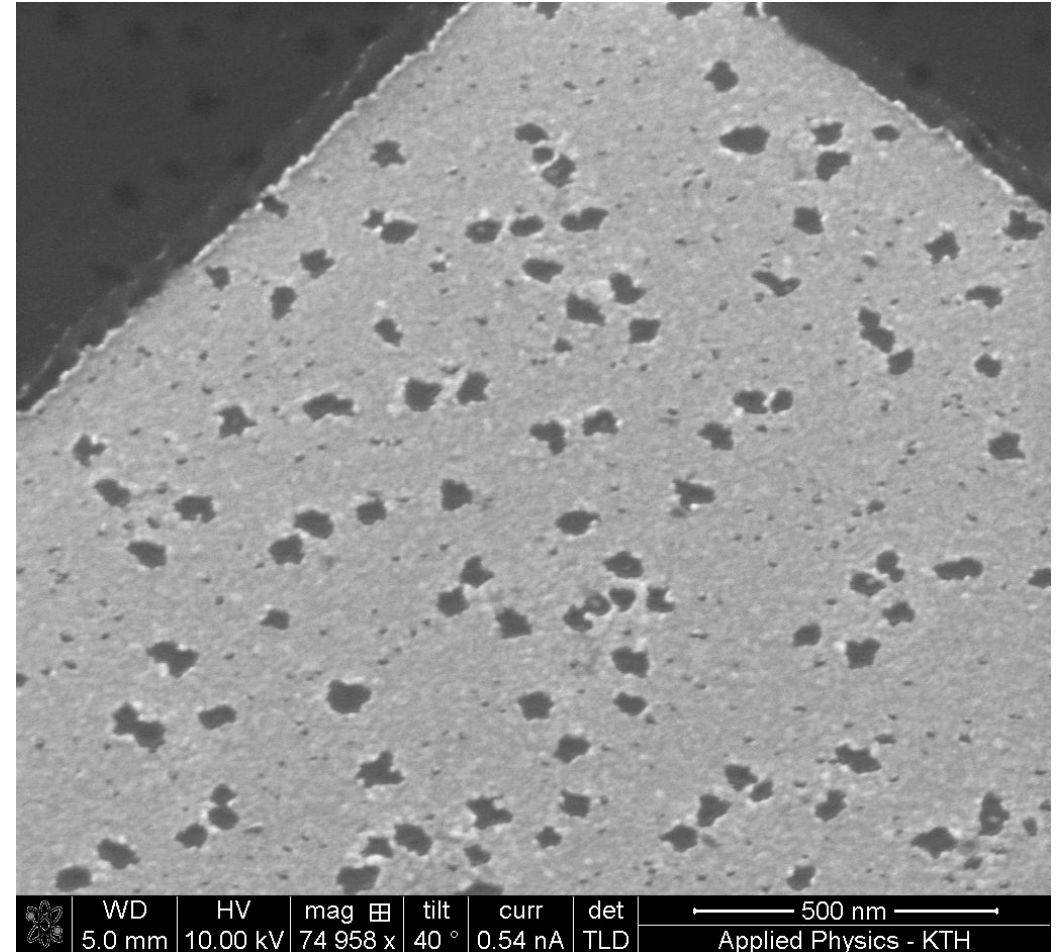
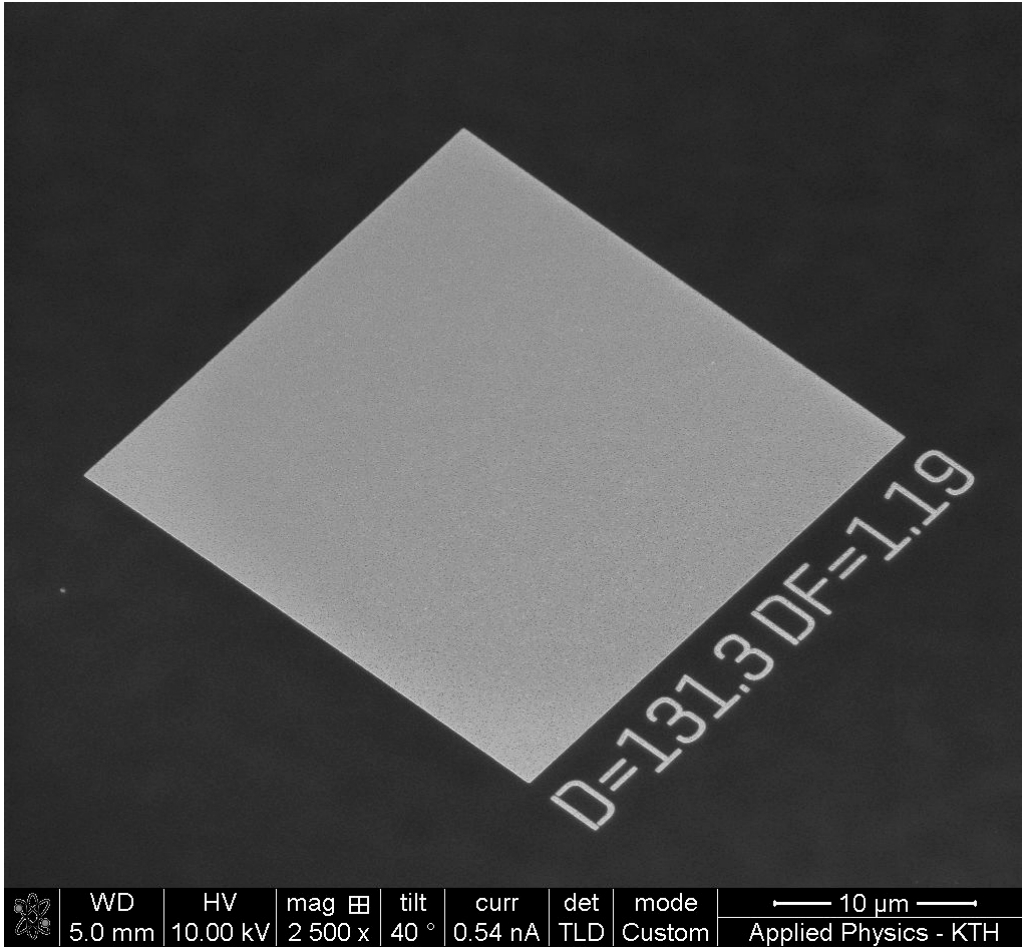
For a dose of 126 $\mu\text{C}/\text{cm}^2$, dose factor 1.15, there is no full clearing of the underlying resist. The remaining resist is however only present in modest amounts.

Dose 128.7 $\mu\text{C}/\text{cm}^2$



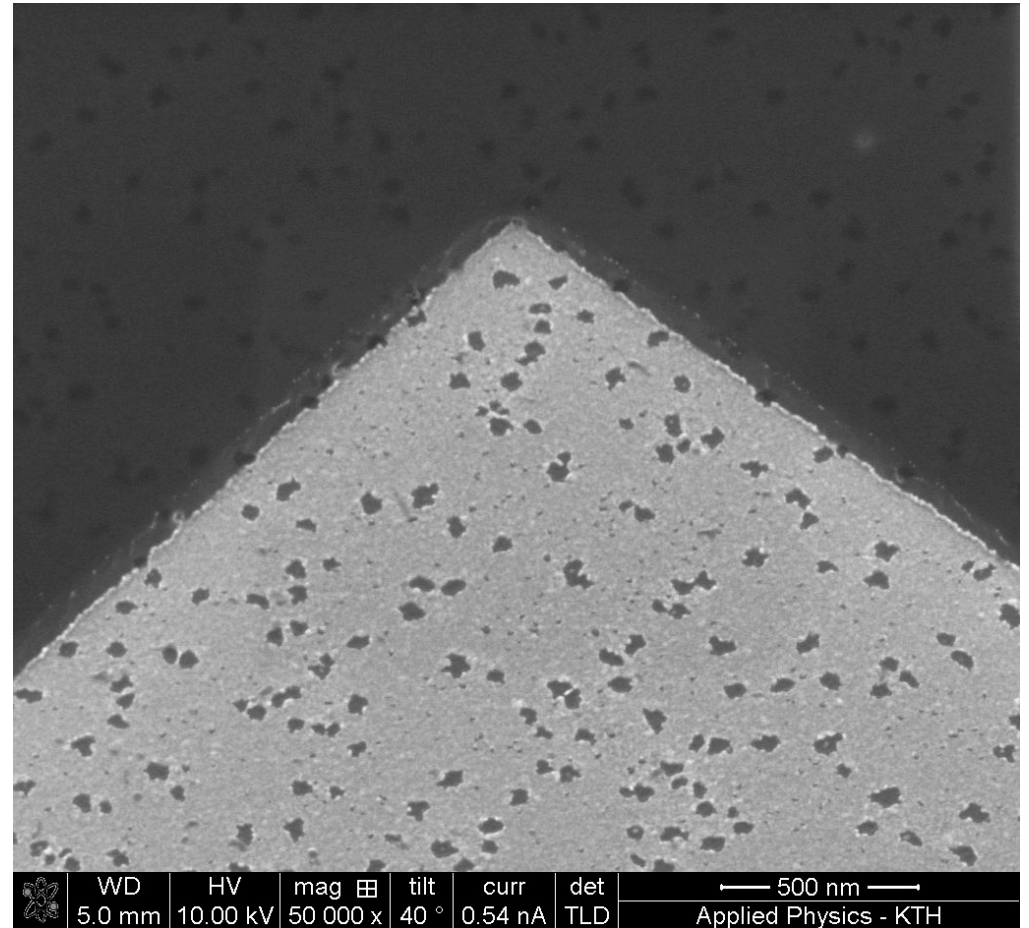
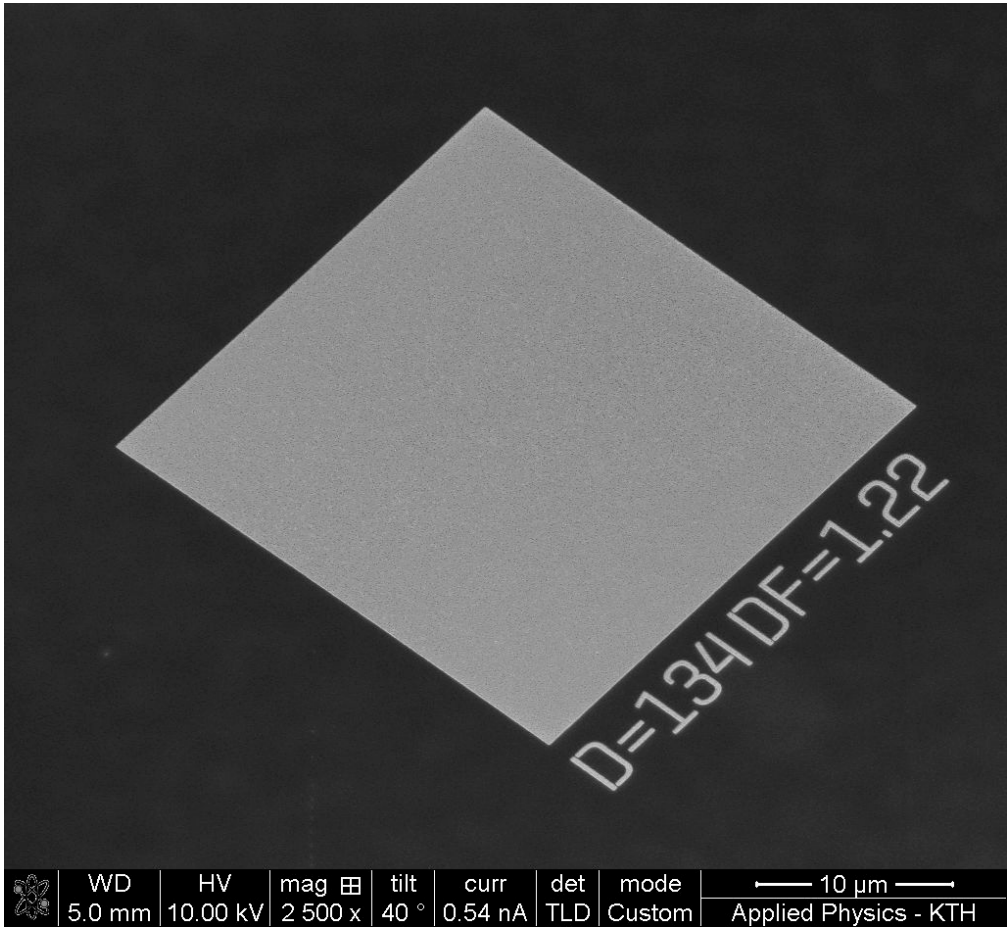
For a dose of 128.7 $\mu\text{C}/\text{cm}^2$, dose factor 1.17, the resist is almost clear. Only faint tendencies of resist seems to remain, hence we are nearing a clearing dose.

Dose 131.3 $\mu\text{C}/\text{cm}^2$



For a dose of 131.3 $\mu\text{C}/\text{cm}^2$, dose factor 1.19, seemingly no resist remain. We might assume that clearing dose has been reached at this point.

Dose 134 $\mu\text{C}/\text{cm}^2$



For a dose of 134 $\mu\text{C}/\text{cm}^2$, dose factor 1.22, the resist has been cleared. We are past clearing dose.