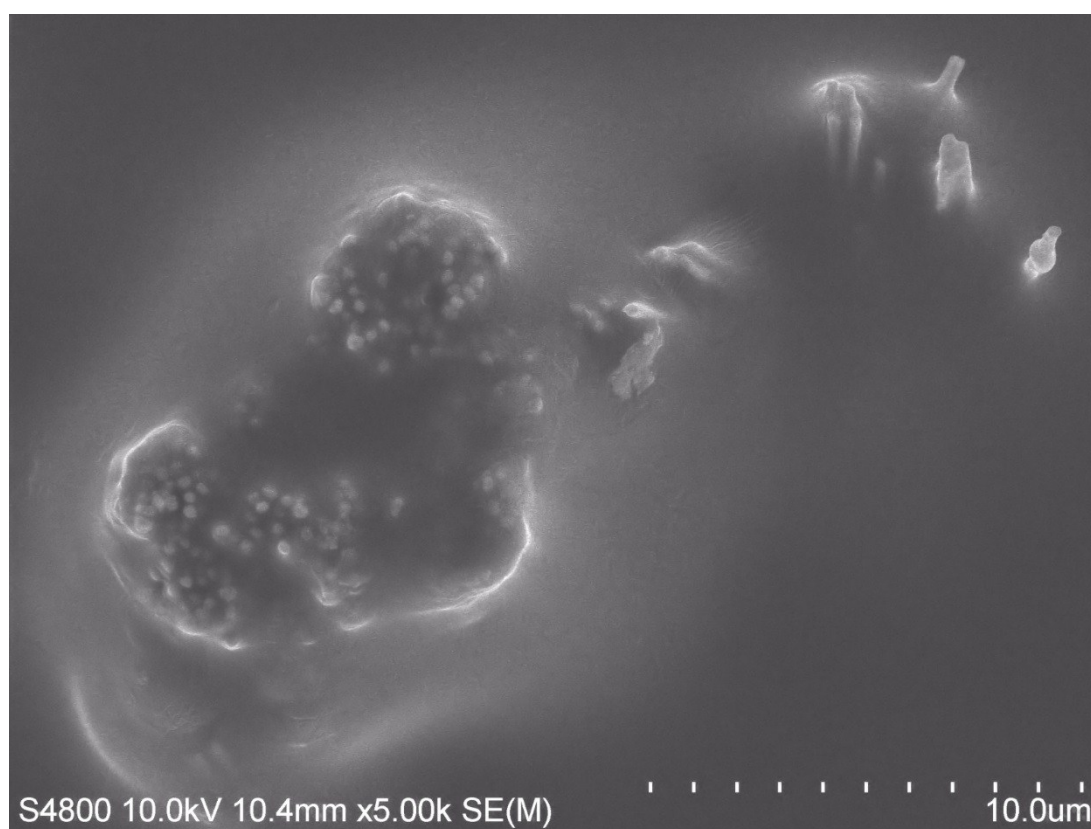
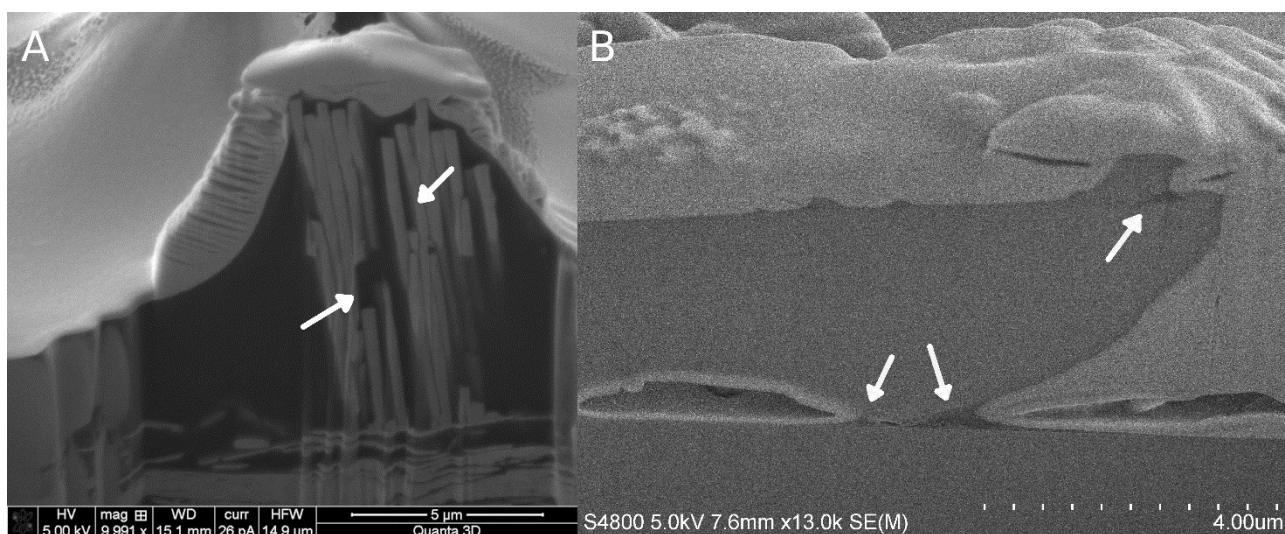


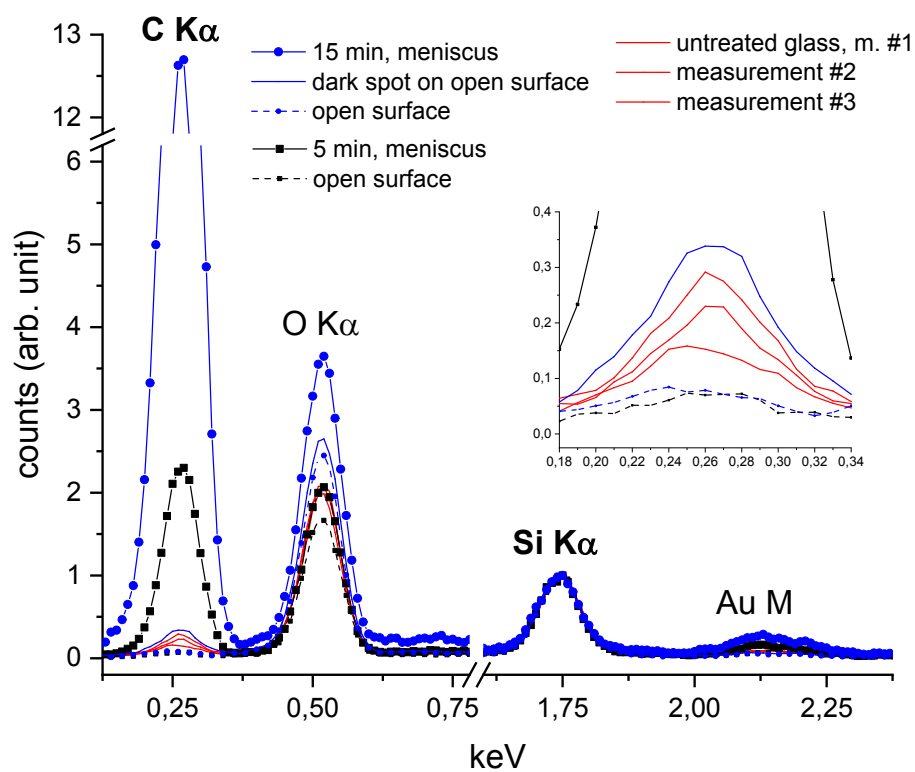
## Supplementary data



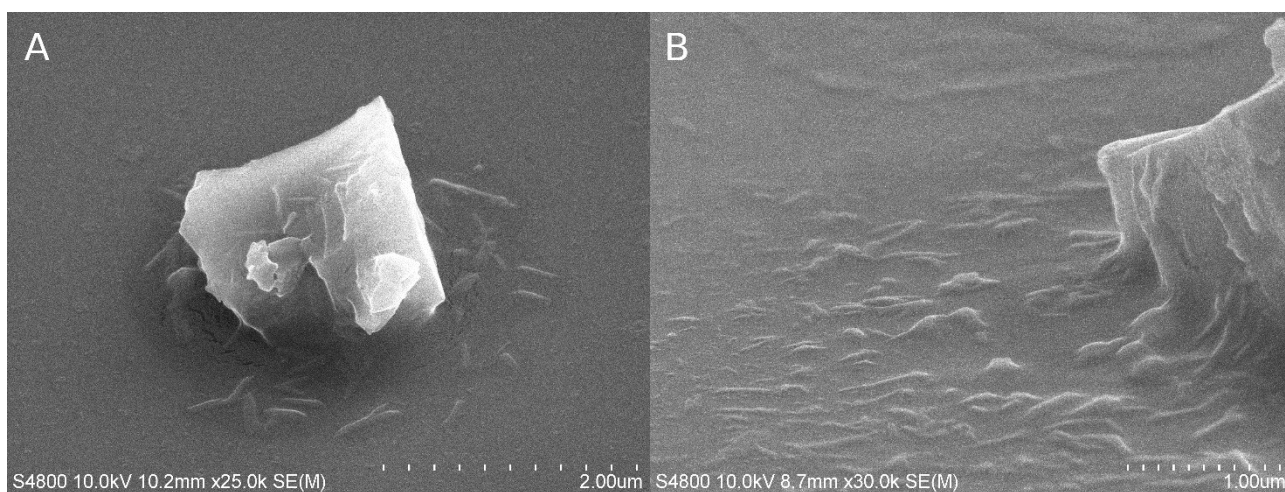
Supplementary Figure 1. FESEM micrograph on Ni nanopillar substrate after 5 min initiation at 96% SR. Noise removal filter has been applied on the image.



Supplementary Figure 2. FIB-SEM cross-sectional micrographs. The pale layers are either the original protective FIB coating or a redeposited mixture consisting of Pt(Ga)-C composite and substrate matter caused by the Ga ion milling. (A) Perfect polymeric filling even in the most complex cavities between Ni nanopillars (white arrows). SR 86%, 8 min initiation. (B) Glass particle on glass with dark polymeric filling between surfaces (white arrows). SR >95%, 5 min initiation.

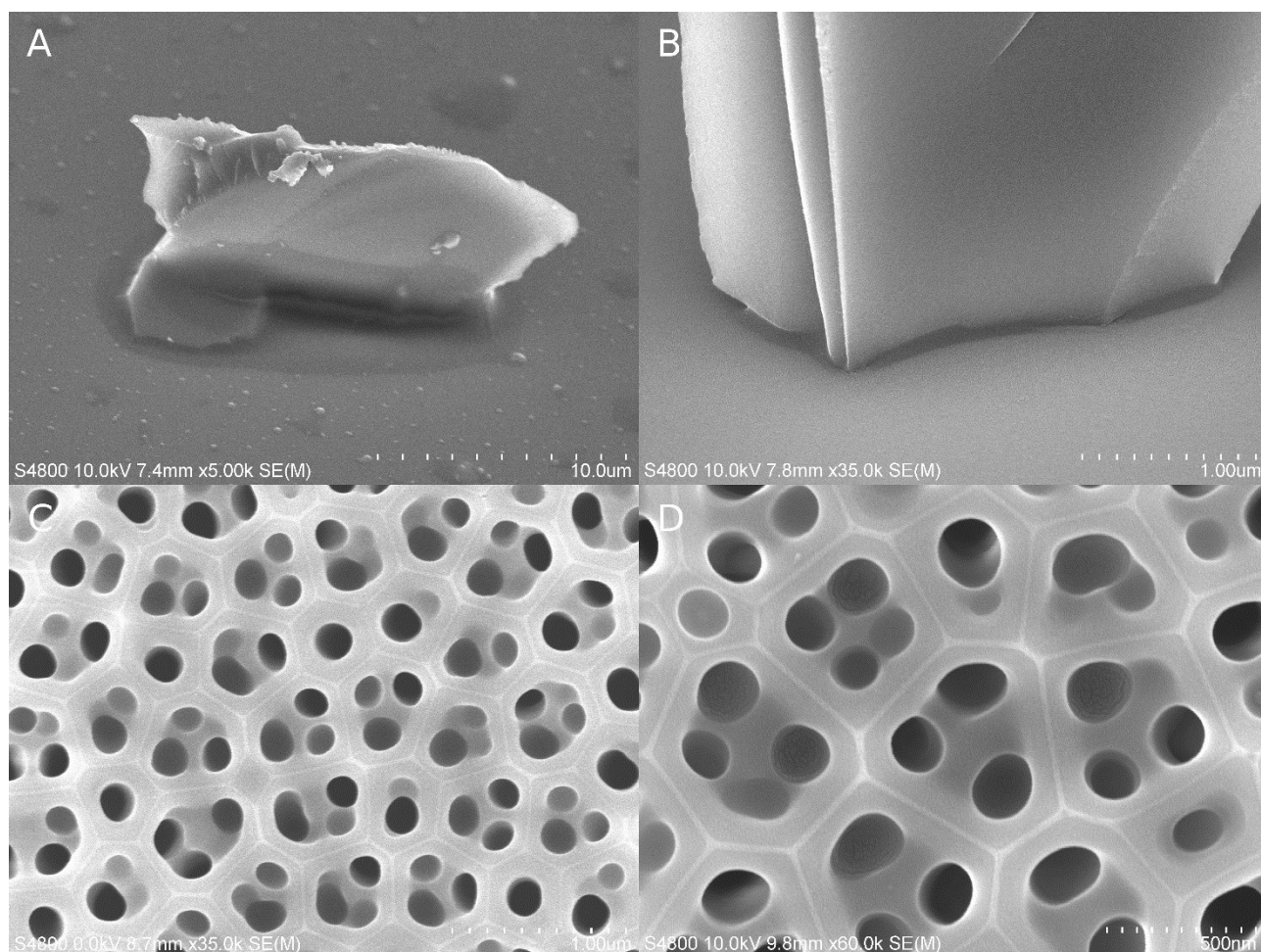


Supplementary Figure 3. EDS spectra on glass substrates at >95% SR. Blue: 15 min UV initiation, black: 5 min initiation, red: reference glass sample. Gold is from the Au-Pd coating which was sputtered to prevent electron beam damage to the sample. Detail of low keV range as inset.



Supplementary Figure 4. FESEM micrographs on experiments with added oxygen in the carrier gas.

(A) Rod-like particles in polymerized meniscus. SR >95%, 8 min initiation, 3% O<sub>2</sub>. (B) Severely malformed meniscus. SR >95%, 15 min initiation, 20% O<sub>2</sub>.



Supplementary Figure 5. SEM micrographs for styrene and *t*-BMA at >95% SR without added oxygen. (A) *t*-BMA on glass with >1 μm wide meniscus. (B) styrene on glass with ca 100 nm wide meniscus. (C) *t*-BMA on AAO. (D) styrene on AAO.