



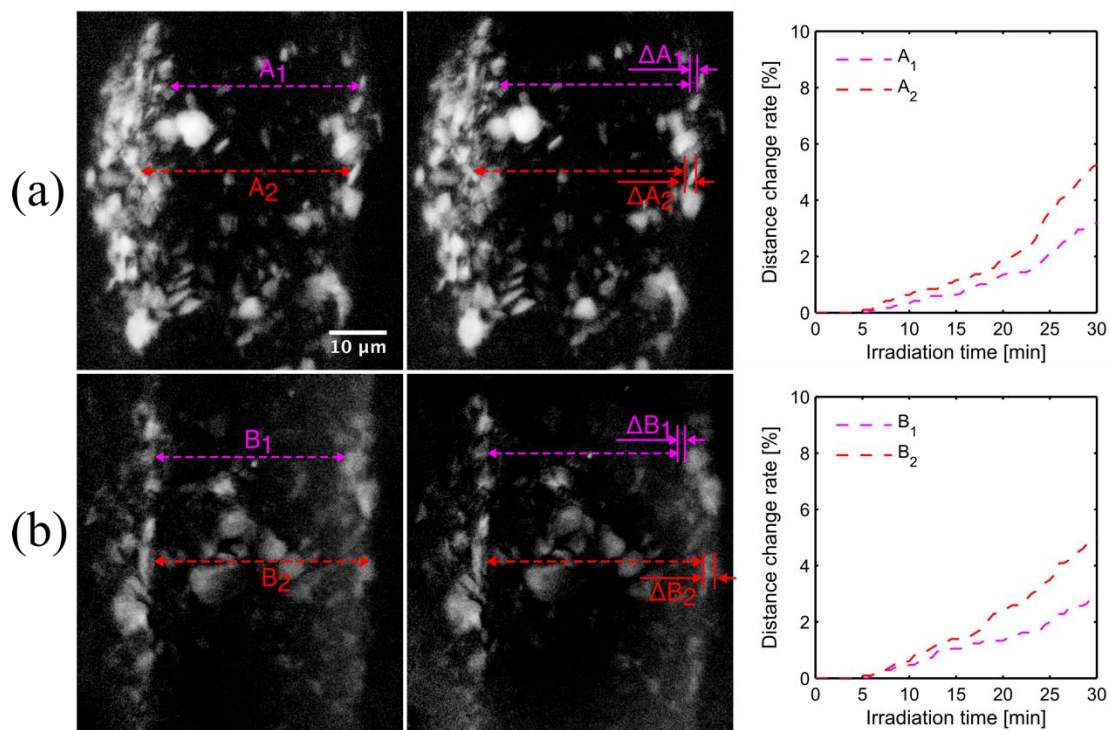
JOURNAL OF  
SYNCHROTRON  
RADIATION

**Volume 24 (2017)**

**Supporting information for article:**

**Hard X-ray-induced damage on carbon–binder matrix for *in situ* synchrotron transmission X-ray microscopy tomography of Li-ion batteries**

**Cheolwoong Lim, Huixiao Kang, Vincent De Andrade, Francesco De Carlo and Likun Zhu**



**Figure S1** Series of TXM images are captured to monitor radiation damage on  $\text{Ge}_{0.9}\text{Se}_{0.1}$  electrode in electrolyte environment at 11.2 keV (after Ge K-edge) and 11 keV (before Ge K-edge). The continuous TXM images are obtained at (a) 11.2 keV with 1 s exposure time and (b) 11 keV with 3.9 s exposure time. The TXM images show initial (left) and 30 min (middle) irradiated  $\text{Ge}_{0.9}\text{Se}_{0.1}$  particle cluster with 37.7 nm pixel resolution. The increment of particle distances is tracked by the accumulated X-ray dose (right). The results show that the expansion of  $\text{Ge}_{0.9}\text{Se}_{0.1}$  electrode at two energy levels is similar, which demonstrates that the damage is primarily from the absorption of photons by the carbon/binder matrix.