

## Supporting information

Fig. S1 shows the TEM investigations on  $\text{Al}_{0.57}\text{Sn}_{0.43}\text{O}_{1.71}$  and  $\text{Al}_{0.4}\text{Sn}_{0.6}\text{O}_{1.8}$  depicting the structure and morphology of these materials after heating to various temperatures. The chemical analysis of these samples was carried out in the scanning transmission electron microscopy (STEM) mode by using the EDX detector. These results were in agreement with the results obtained by the other methods. The Al:Sn:O ratio (in at %) is 11.6% : 18.5% : 69.9% and 16% : 11.3% : 72.7% through the five point EDX-area measurements on the samples  $\text{Al}_{0.57}\text{Sn}_{0.43}\text{O}_{1.71}$  and  $\text{Al}_{0.4}\text{Sn}_{0.6}\text{O}_{1.8}$ , respectively.

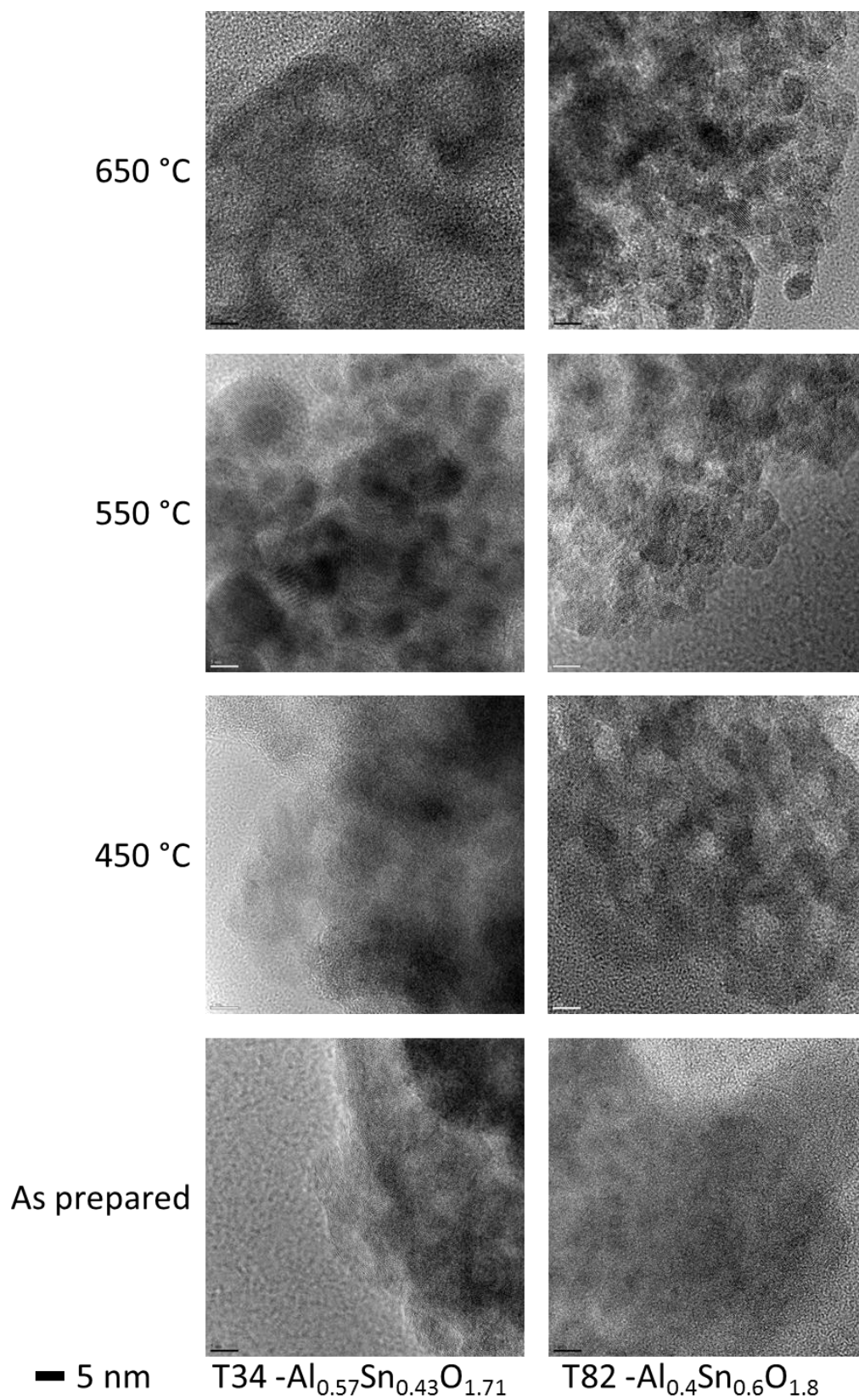


Figure S1: HRTEM micrographs of the  $\text{Al}_{0.57}\text{Sn}_{0.43}\text{O}_{1.71}$  and  $\text{Al}_{0.4}\text{Sn}_{0.6}\text{O}_{1.8}$  depicting the structure and morphology after heating to various temperatures.

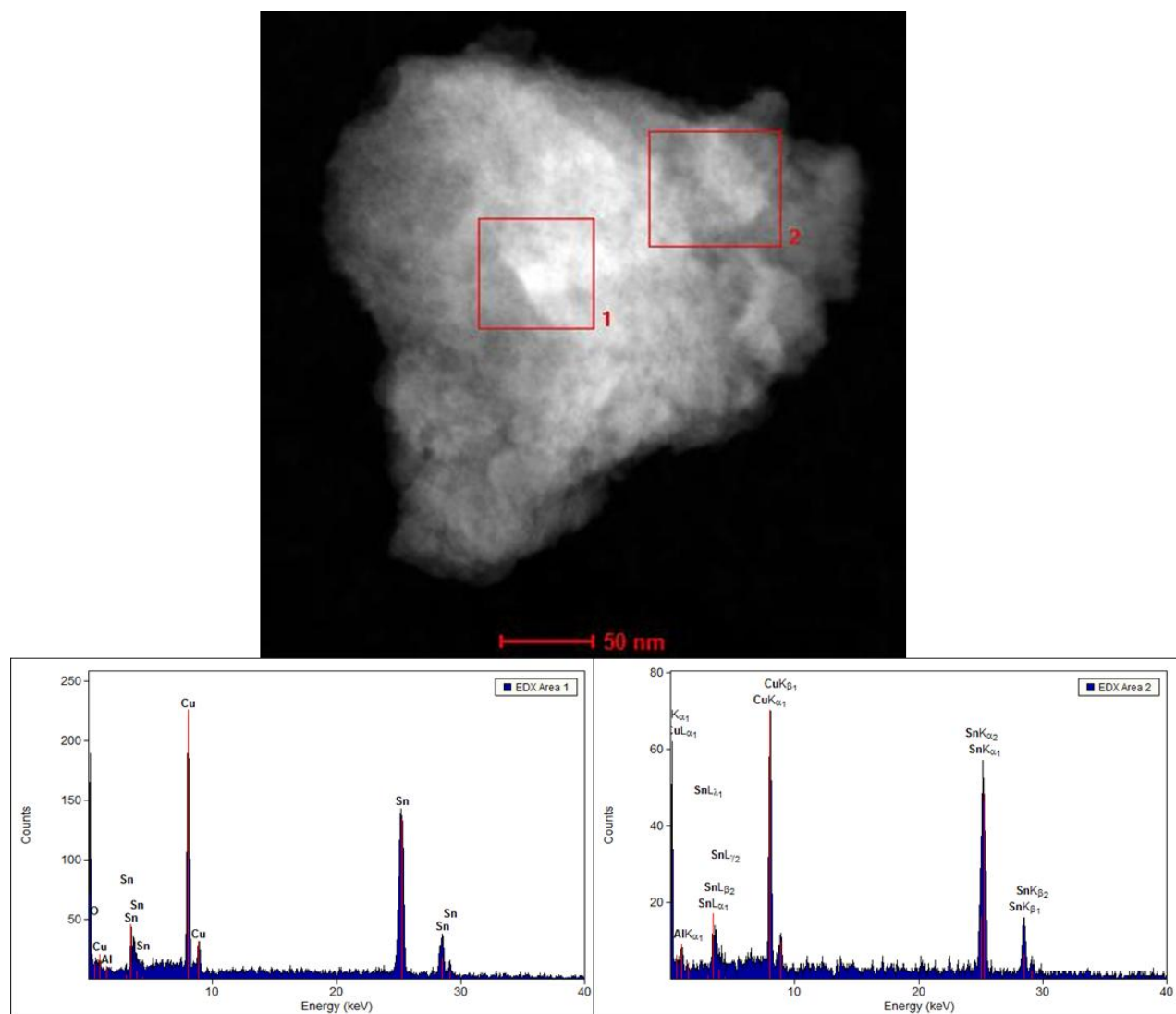


Figure S2: STEM-EDX area analysis of  $\text{Al}_{0.57}\text{Sn}_{0.43}\text{O}_{1.71}$  showing the areas with reduction in Al content.

After heating to 650 °C, regions of depletion/absence of Al were observed through EDX analysis (Fig. S2) for  $\text{Al}_{0.57}\text{Sn}_{0.43}\text{O}_{1.71}$ . This might be due to partial segregation taking place at higher temperatures.