Supporting Information :

About imaging techniques recording and interpretation : The prepared samples are either transferred into high vacuum and imaged with a non-contact atomic force microscope (AFM) or transferred in air and imaged in a Scanning Transmission Electron Microscope (STEM VG HB501 equipped with a field emission source). The similarity between the images obtained in both cases, shows that the transfer in air does not affect the island morphologies (see Figure). These two imaging tools allow a complete topological mapping of the samples. The AFM measurements lead to absolute values of the elevation maps with a high accuracy, while the lateral dimensions suffer from tip convolution effects. On the other hand, STEM imaging performed in the High Angle Annular Dark Field (HAADF) mode provides images with potential sub-nanometre (typically 0.5nm in best cases with the used microscope) spatial resolution but can only map the local thickness semi-quantitatively because references are required. Therefore, the comparison between AFM elevation maps and STEM thickness maps further confirms the interest of the combined dual method approach for a study of morphology transformations in nano-sized objects deposited on a flat graphite surface.

Figure: AFM and STEM images of Sb islands obtained from cluster deposition on HOPG surfaces at room temperature. (a) and (b) result from Sb_{88} deposition, (c) and (d) result from Sb_{300} deposition. (e) and (f): cross-sections of the islands, corresponding to the white lines in (c) and (d) respectively. Notice that only AFM measurements give absolute elevation values. The STEM provides relative thickness values with improved spatial resolution.

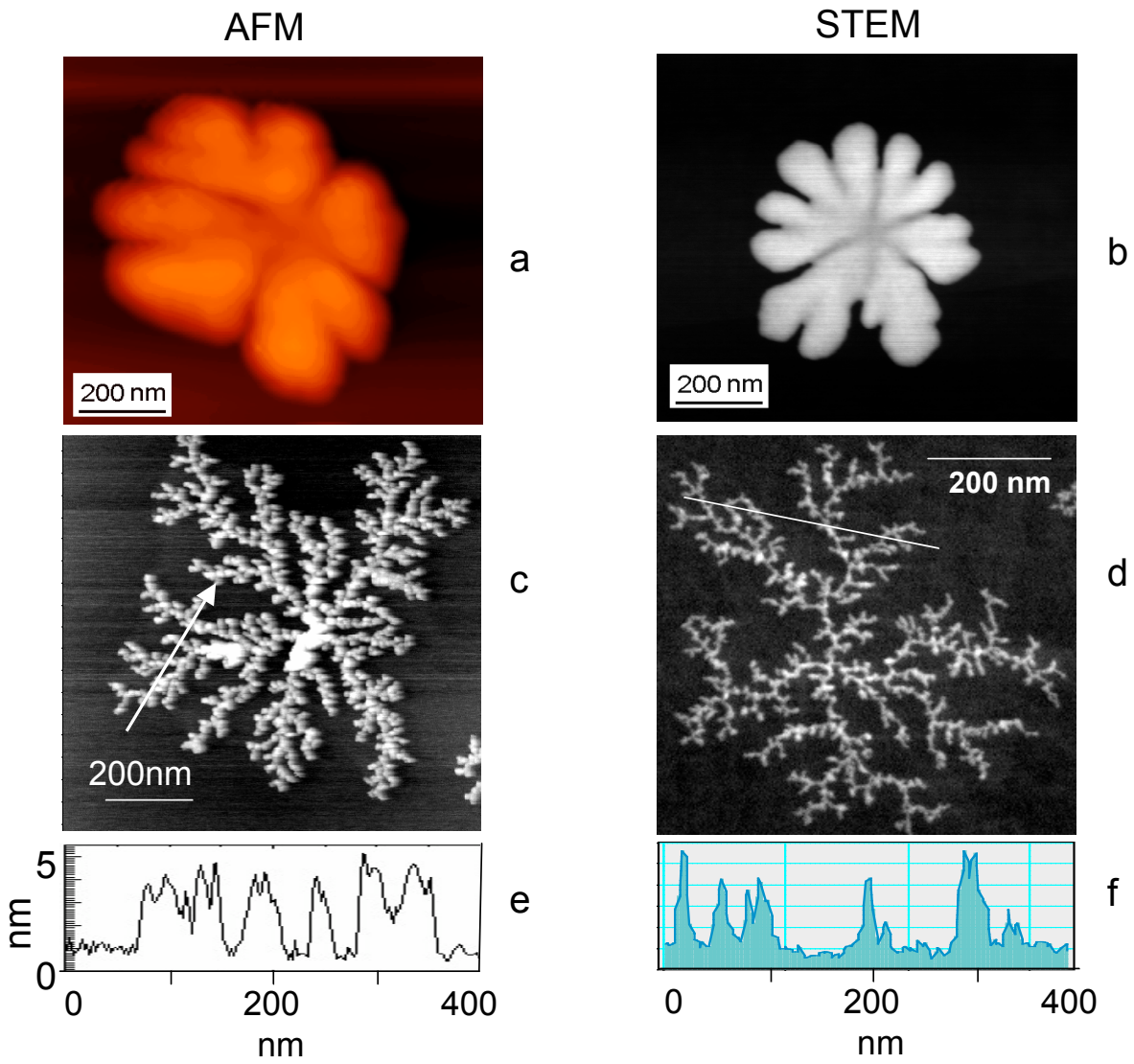
AFM
STEM
200 nm
a
200 nm
b
200nm
c
200 nm
d
5
nm
0
0
200
400
nm
e
0
200
400
nm
f

Figure SI