

Supplementary Materials: Unconventional Deformation Behaviours of Nanoscaled High-entropy Alloys

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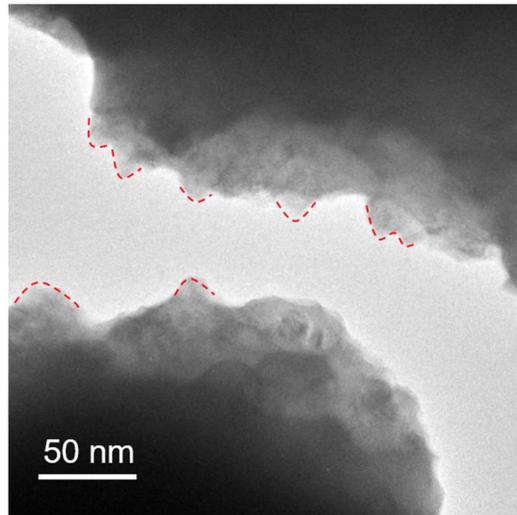


Figure S1. The nano-tips on the fractured surface.

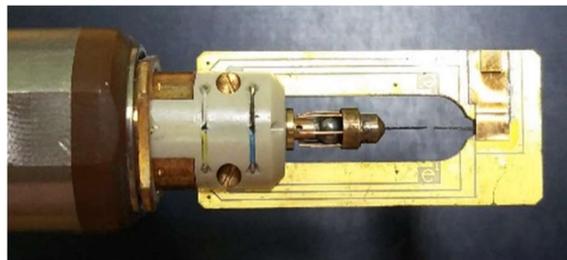


Figure S2. Two teared parts with nano-tips are mounted on a Nanofactory transmission electron microscope (TEM)-scanning tunnelling microscope (STM) TEM holder.

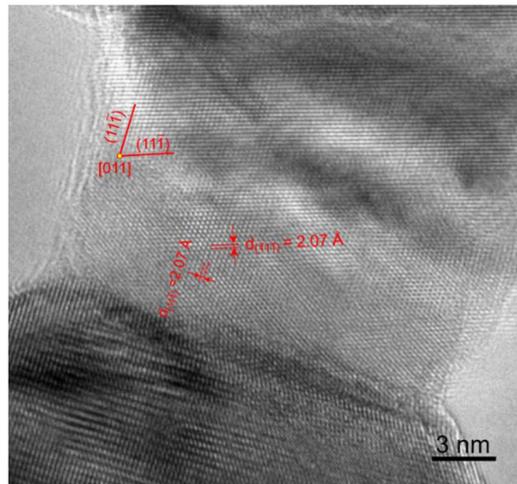


Figure S3. The structure keep unchanged during the preparation process. The crystalline interplanar spacing of the $(\bar{1}\bar{1}\bar{1})$ plane and $(11\bar{1})$ are 2.07 \AA in the nanoscaled HEA, *i.e.* its lattice parameter is 3.59 \AA .

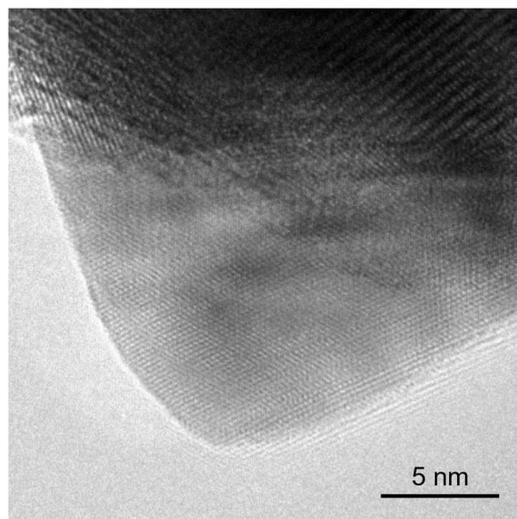


Figure S4. The HRTEM image of the nano-tip. There are no oxide layer on its surface.

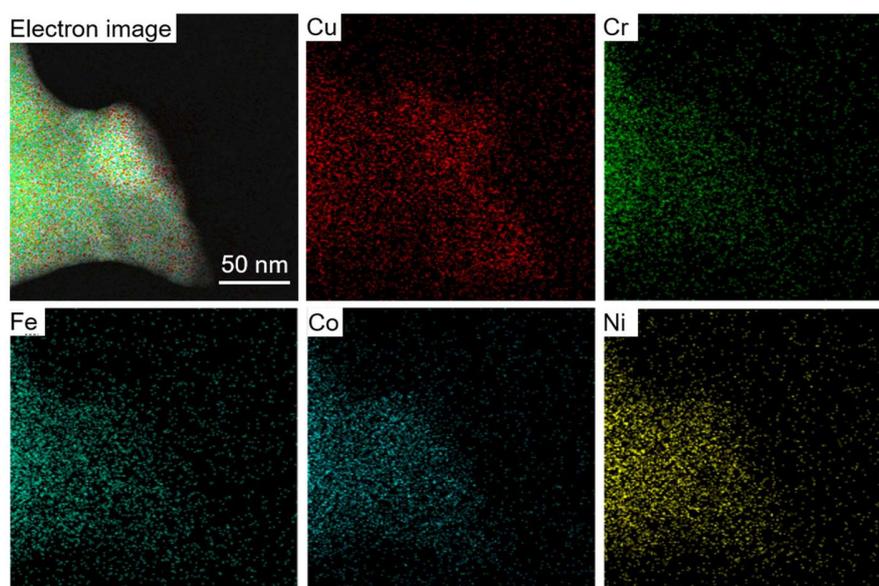


Figure S5. The EDS mapping of the nano-tip shows the elements uniformly distributed in the nano-tip.

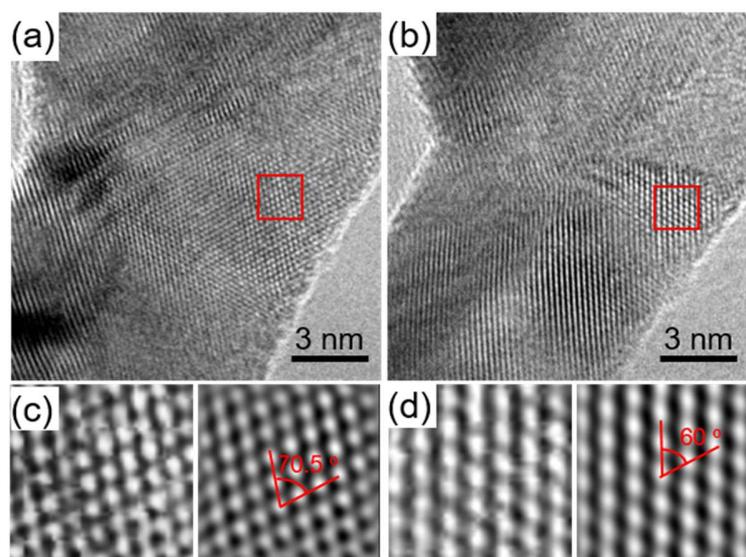


Figure. S6 The another example of the phase transformation. (a) The nanoscaled HEA sample with FCC structure; (b) the nanoscaled HEA after pulling; (c) is enlarged image and inverse fast Fourier transform image corresponding to the red square area in (a), and its angle between two close package plane is 70.5° , which is the typical characteristic of FCC lattice; (d) is enlarged image and inverse fast Fourier transform image corresponding to the red square area in (b), and its angle between two close package plane is 60° , which is the typical characteristic of BCC lattice.

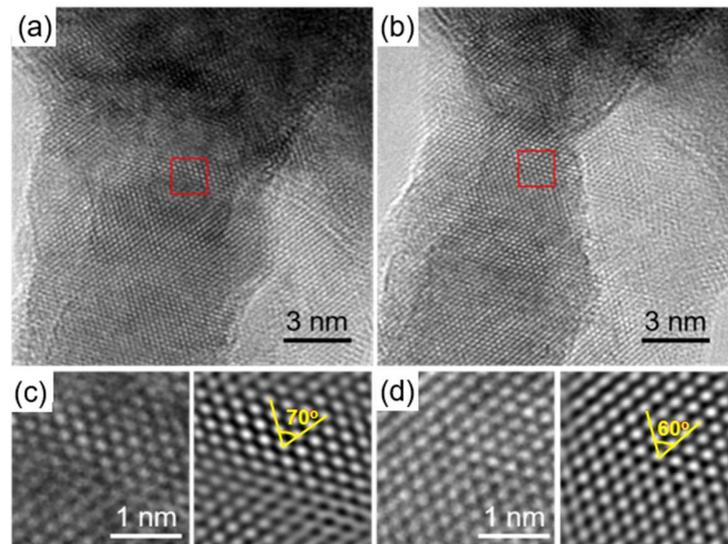


Figure S7. The verification experiments about the effects of electron irradiation. (a) The nanoscaled HEA sample with FCC structure, and we pulled the sample at beam-blank condition; (b) the nanoscaled HEA after pulling at beam-blank condition; (c) is enlarged image and inverse fast Fourier transform image corresponding to the red square area in (a), and its angle between two close package plane is 70° , which is the typical characteristic of FCC lattice; (d) is enlarged image and inverse fast Fourier transform image corresponding to the red square area in (b), and its angle between two close package plane is 60° , which is the typical characteristic of BCC lattice. The phase transformation was still observed at beam-blank condition, and confirm the negligible effect of the electron irradiation.