

ADVANCED MATERIALS

Supporting Information

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Irradiation-Induced Extremes Create Hierarchical Face-/
Body-Centered-Cubic Phases in Nanostructured High Entropy
Alloys

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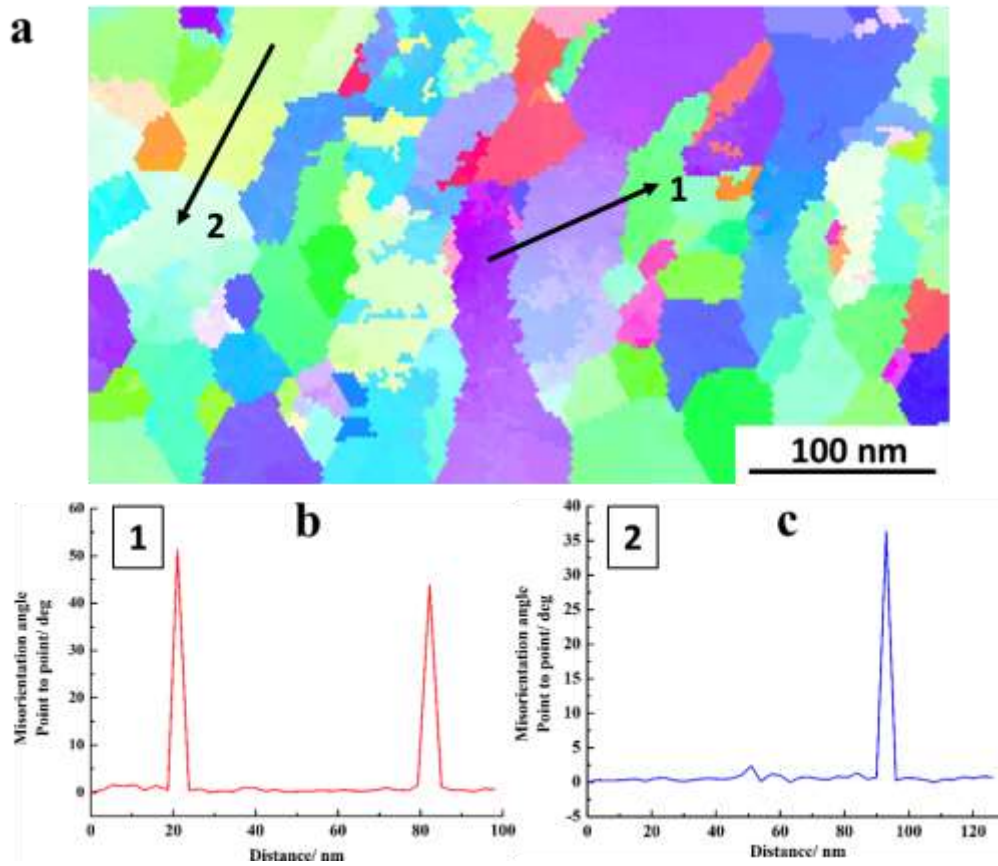


Figure S1. TKD results of the NiFeCoCrCu film after Ni ion irradiation to 24 dpa. a) TKD image, exhibiting a close-up of series of nanocrystalline grains. b,c) Misorientation profiles measured along the arrowed lines in (a), numbered correspondingly. High-angle grain boundaries are popular in the current NiFeCoCrCu HEA films. (Misorientation here is the orientation difference between the trailing point and the leading point).

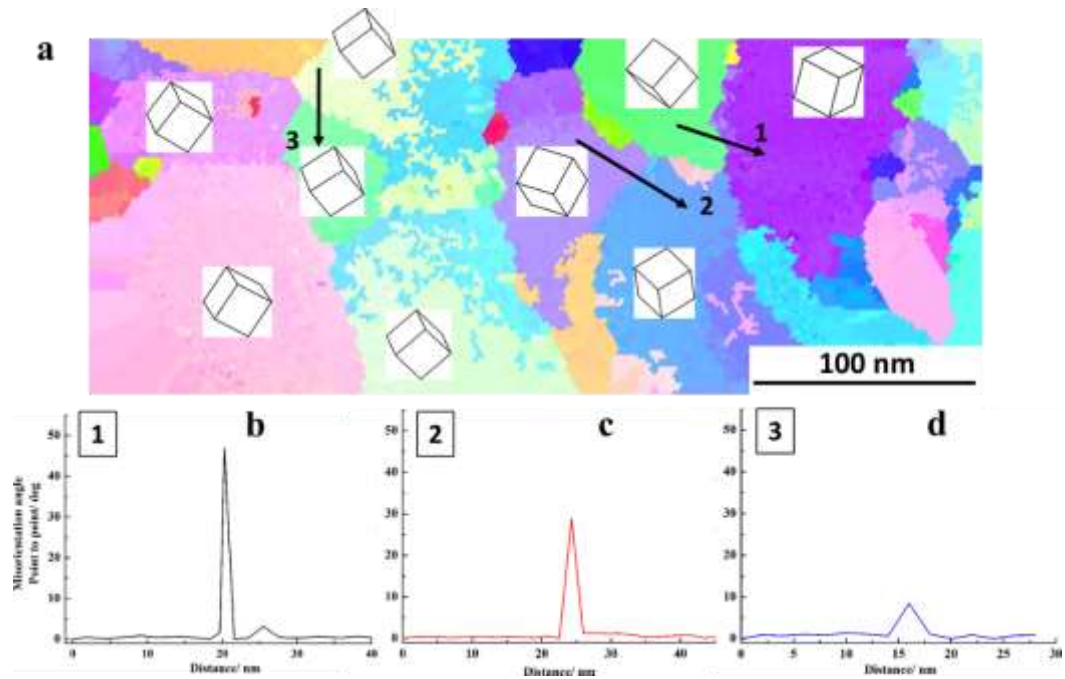


Figure S2. TKD results of the NiFeCoCrCu film after Ni ion irradiation to 370 dpa. a) TKD image, exhibiting a close-up of series of nanocrystalline grains with different orientations. The grain orientation difference of the vertically adjacent grains is small, while that of the horizontally adjacent grains is relatively large, which indicates a directional growth of the crystalline grains. b-d) Misorientation profiles measured along the arrowed lines in (a), numbered correspondingly. (Misorientation here is the orientation difference between the trailing point and the leading point).

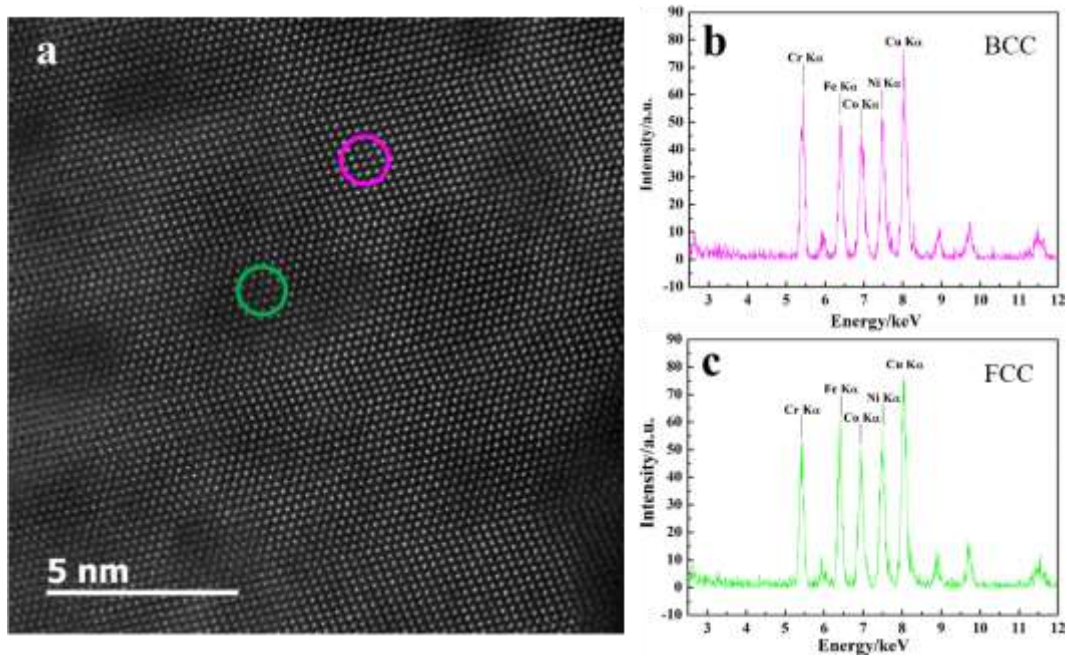


Figure S3. Elemental distribution in the NiFeCoCrCu film irradiated to 370 dpa by EDS analysis. a) HAADF image, exhibiting the configuration of the FCC crystal lattices interspersing with the BCC crystal lattices (marked by green and pink circles, respectively). b,c) EDS results from the selected regions in (a), colored correspondingly. The content of the Cr element in BCC phase is higher than that in FCC phase. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

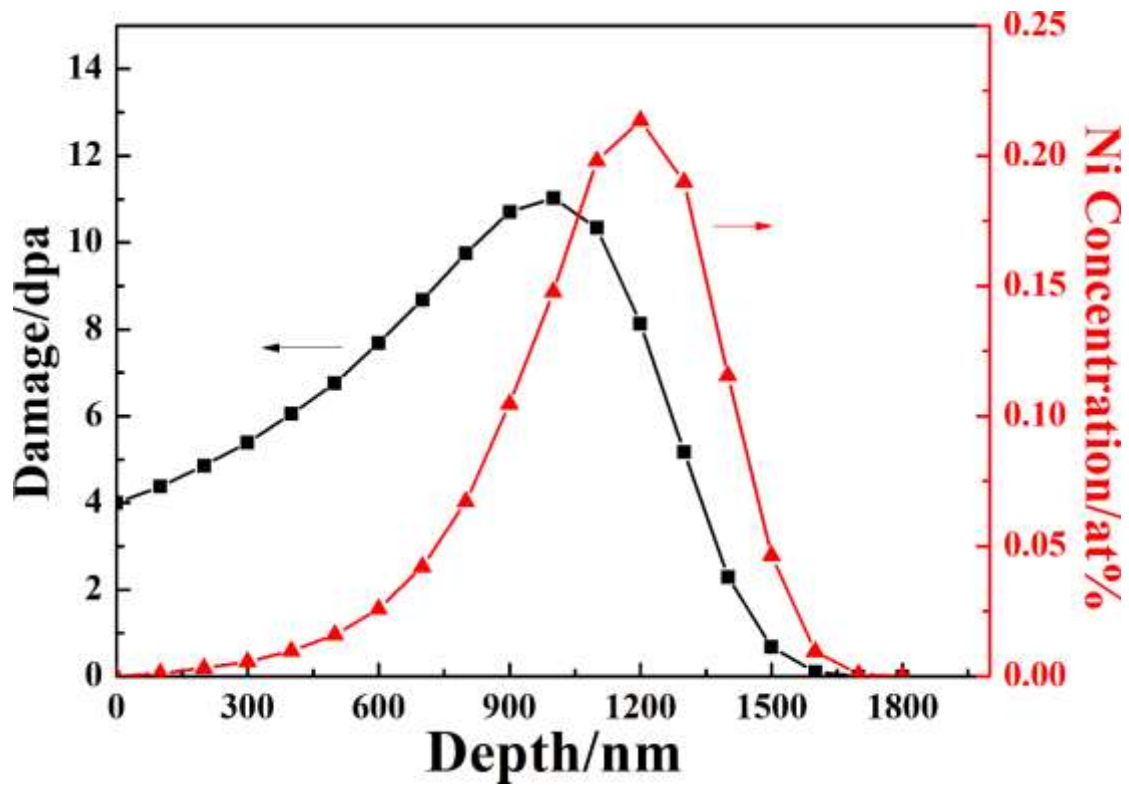


Figure S4. Depth profiles of displacement per damage (dpa) and induced Ni ion concentration predicted by SRIM code for the NiFeCoCrCu film irradiated with 3 MeV Ni ions to a fluence of 1×10^{16} ions·cm⁻².