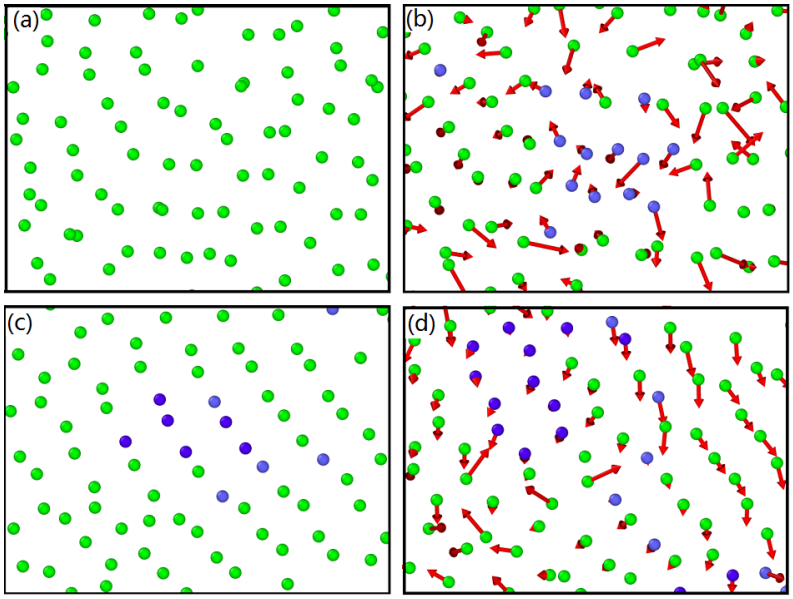

Figure 1. Atomic configurations of (a) amorphous gold and (c) nanocrystalline gold for grain size of 1 nm with deforming 1% for 0.1 ps. (b) and (d) atomic structure in Fig. S1a and S1c with relaxing for 600 ps, respectively. Blue and green represent grain interiors with fcc and atoms at grain boundaries, respectively.

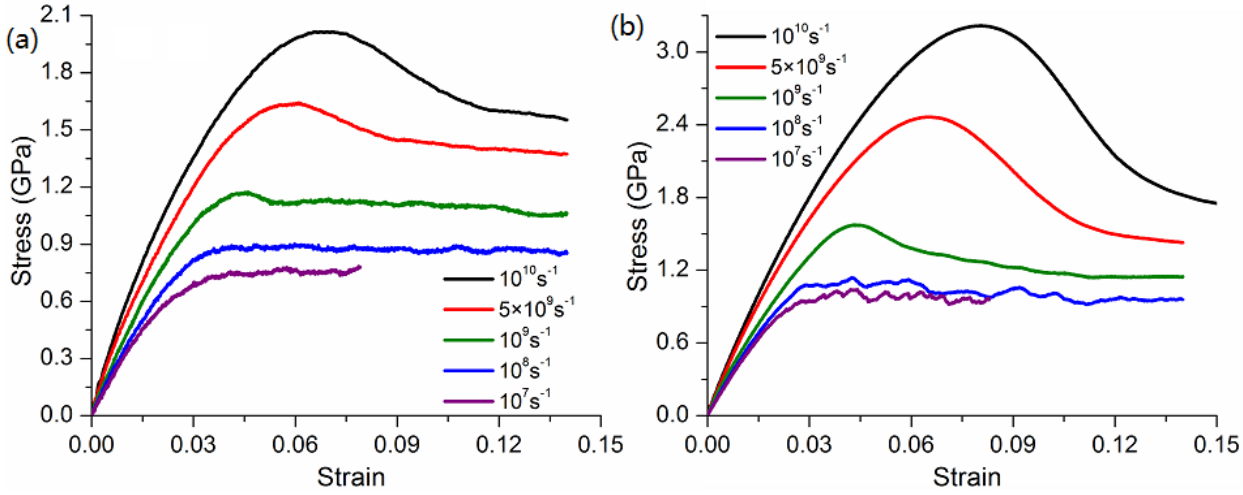

Figure 2. (a) Stress-strain curves for nanocrystalline gold simulations of grain size (a) 6 nm and (b) 18 nm with different strain rate.

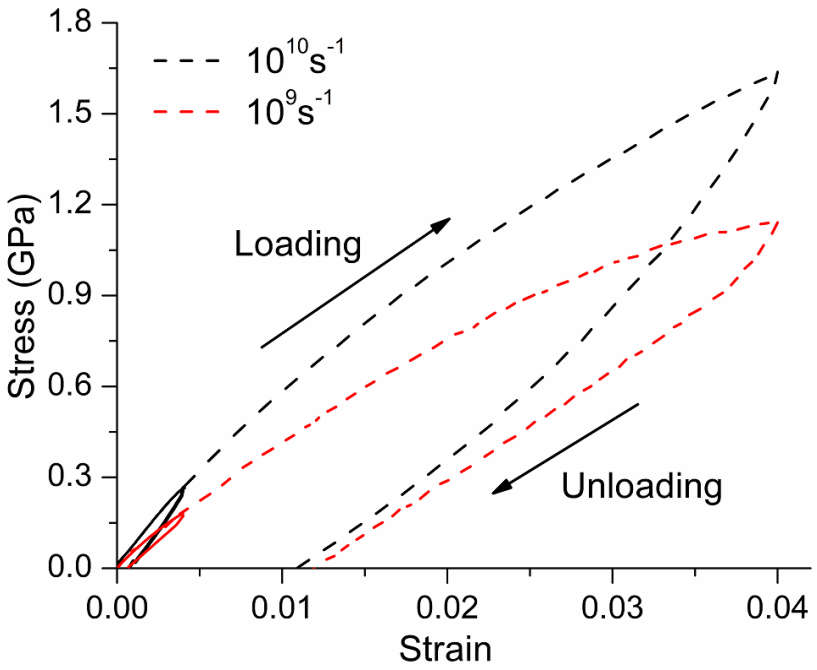

Figure 3. Stress-strain curves of nanocrystalline gold simulations with grain size of 6 nm including the loading and unloading processes with the max strain of 0.4% and 4% under strain rates 10^{9} s^{-1} and 10^{10} s^{-1}, respectively.

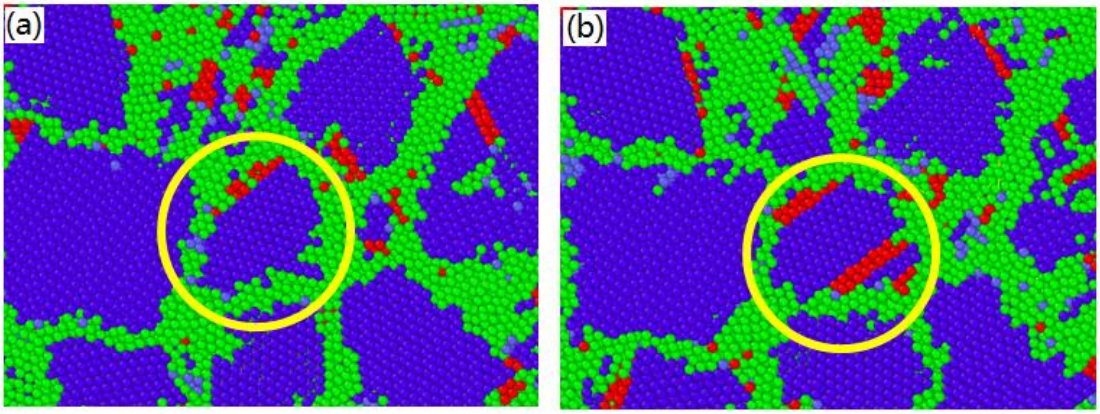

Figure 4. Atomic configurations for nanocrystalline gold of grain size 3.8 nm with a strain rate of 5×10^{9} s^{-1} at tensile strain (a) 0% and (b) 4.5%. Blue, red and green represent grain interiors with fcc, stacking faults with hcp, and atoms at grain boundaries, respectively.

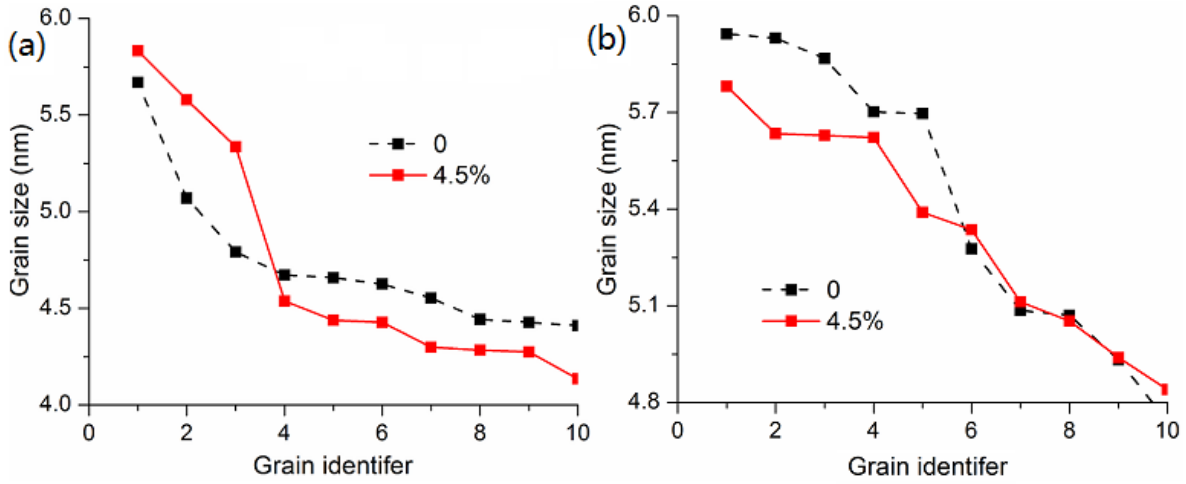

Figure 5. Grain size for nanocrystalline gold with mean grain size of (a) 3.8 nm and (b) 4.5 nm as a function of grain identifier at a strain rate of 5×10^{9} S^{-1}.

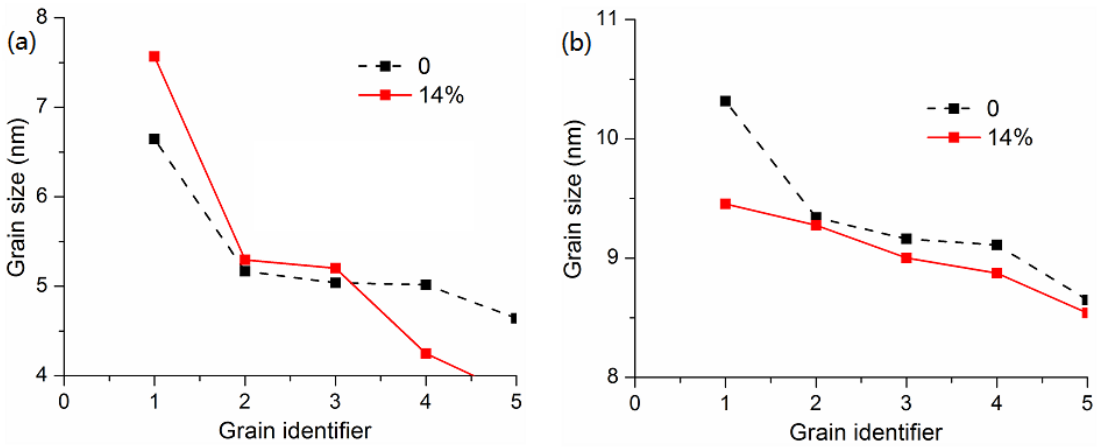

Figure 6. Grain size for nanocrystalline gold with mean grain size of (a) 5 nm and (b) 6 nm as a function of grain identifier at a strain rate of 10^{9} S^{-1}.

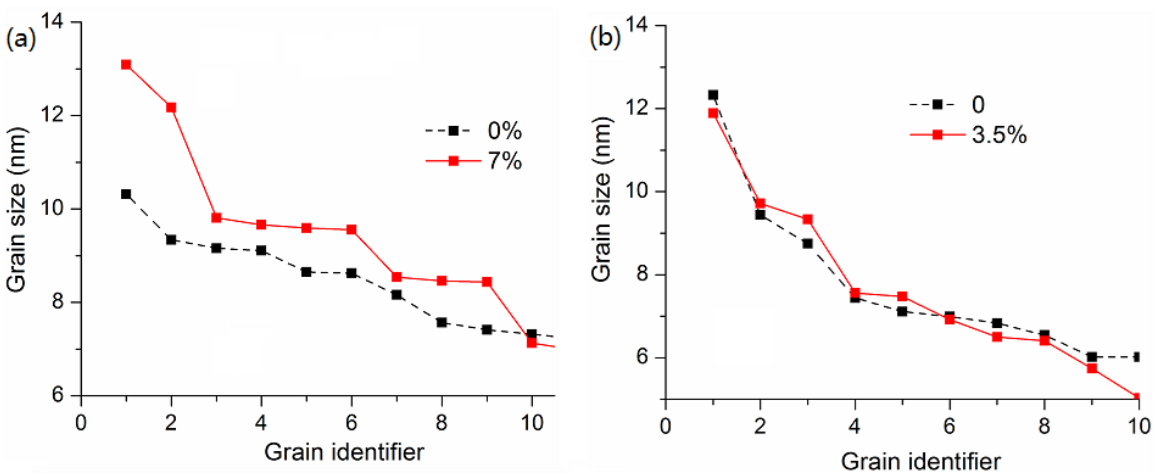

Figure 7. Grain size for nanocrystalline gold with mean grain size of (a) 6 nm and (b) 7 nm as a function of grain identifier at a strain rate of 10^{8} S^{-1}.

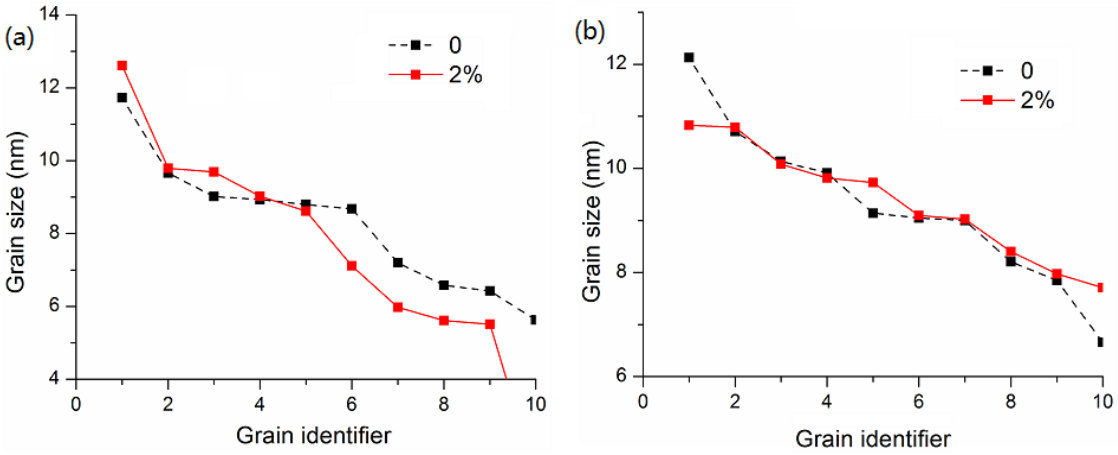

Figure 8. Grain size for nanocrystalline gold with mean grain size of (a) 8 nm and (b) 9 nm as a function of grain identifier at a strain rate of 10^7 S^{-1}.

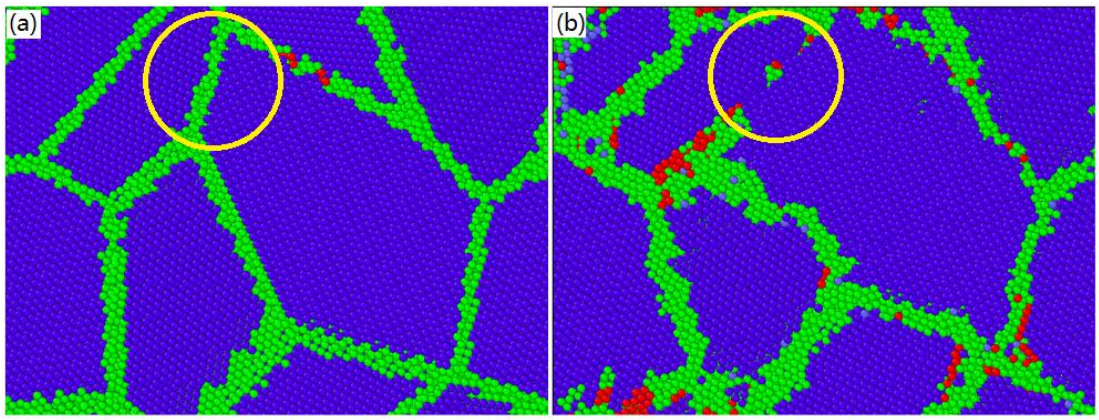

Figure 9. Atomic configurations for nanocrystalline gold of grain size 7 nm with a strain rate of 10^8 s^{-1} at tensile strain (a) 0% and (b) 3.5%. Blue, red and green represent grain interiors with fcc, stacking faults with hcp, and atoms at grain boundaries, respectively.