An electron microscopy study of microstructural evolution during in-situ annealing of heavily deformed nickel

The microstructure of heavily deformed pure nickel processed by accumulative roll bonding to a von Mises strain of 6.4 has been investigated using both transmission electron microscopy and transmission Kikuchi diffraction in a scanning electron microscope. By monitoring the microstructure in one region during in-situ annealing in a transmission electron microscope, it is found that 9% of all triple junctions present in this region have migrated over more than 40 nm. Junctions formed by three high angle boundaries are observed to be more prone to motion during recovery than any other junctions. The extent of triple junction motion in the Ni sample is compared to that in heavily deformed aluminum.