Evolution of the microstructure during recrystallization in polycrystalline materials may be characterized by direct or indirect methods. Direct methods provide actual images of the microstructure at different times during the process. Indirect methods infer these changes from the variation of a secondary parameter that is correlated with the microstructure. One such example is the four-point probe resistance measurement, in which the resistivity is correlated to grain size and perfection of the material within the current path. This is a widely used, inexpensive method. In this poster the fidelity of the resistance measurements to the changes in microstructure is investigated. We present concurrent four-point probe resistivity measurements and synchrotron x-ray diffraction data from samples undergoing recrystallization. The data show that stand-alone resistivity measurements may not be sufficient for accurate characterization; these measurements should be supplemented by complementary techniques, especially when “unknown” samples are first characterized.