

X-Ray Diffraction

We are studying the incorporation of neutron absorbing element boron on the surface of potential fuel cladding materials using two different approaches (i) a cold spray process developed at Westinghouse to spray ZrB₂, and (ii) surface alloying of boron by an energetic ion beam process developed at Sandia National Laboratories. The SEM, EDS, and x-ray diffraction facilities at the MSC have been very valuable to us in characterizing surface modified layers before and after high temperature oxidation of these materials.

Figure 1 shows the x-ray diffraction patterns for cold sprayed ZrB₂ and clearly establishes the presence of stoichiometric zirconium-diboride in the coating.

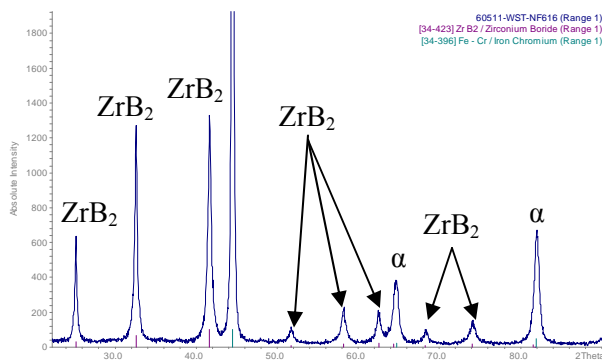


Figure 1. X-ray diffraction of cold sprayed ZrB₂ films.