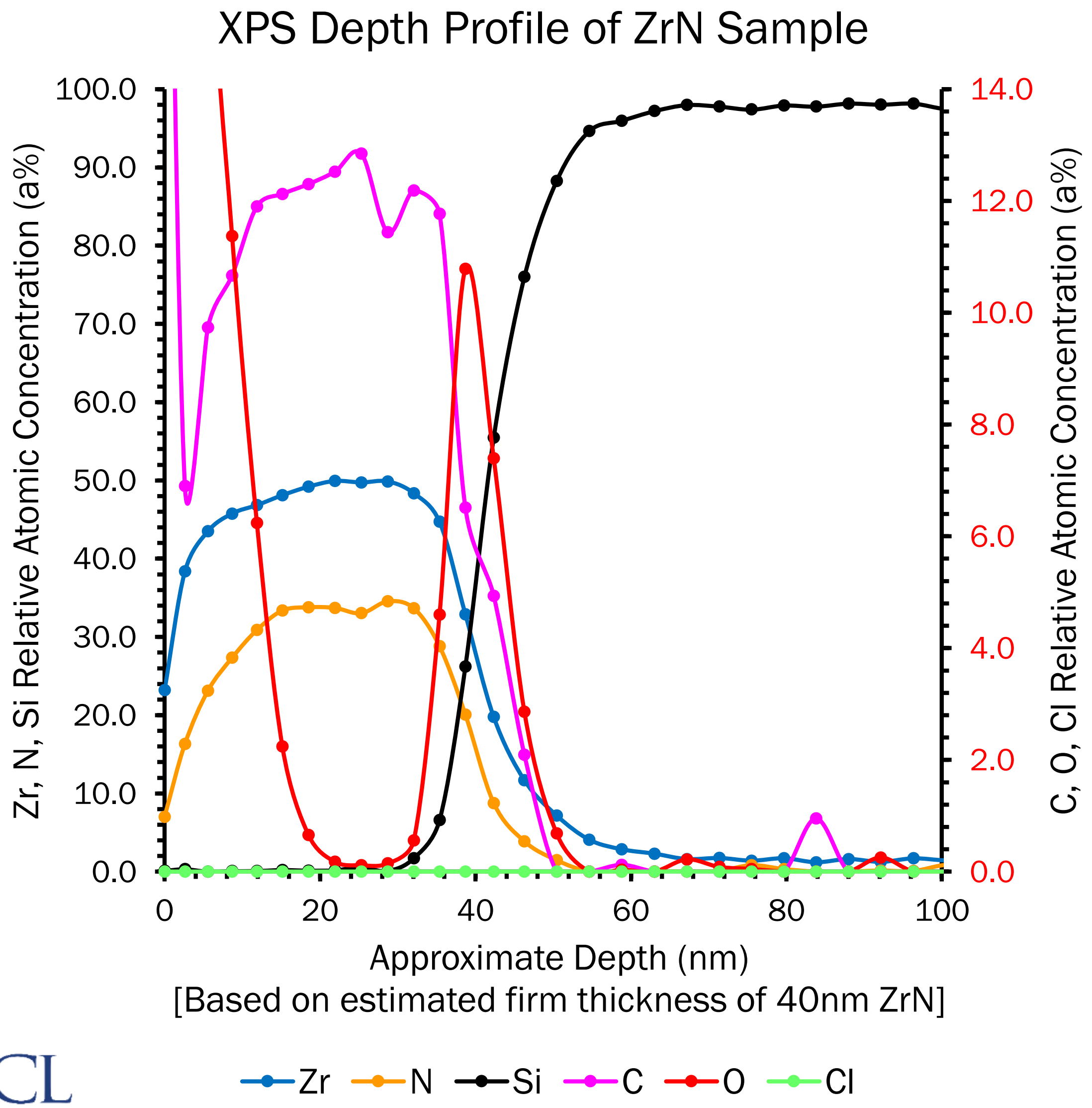
# Examination of Carbon and Oxygen in ZrN film sample



- Oxygen can only be evaluated in the film starting at about 20nm in depth and to about 30nm in depth. This is due to roughness of the film and oxidation of the surface. In this region oxygen was measured at 0.1 – 0.2 a% which based on the oxygen measured in the substrate is at the limit of the sensitivity for this setup.
- Carbon averages over 12 a%. Based on peak position, the Carbon is present as a carbide in the sample.
- Note, from a discussion with Jeff Shallenberger, Oxygen was checked at the beginning of the analysis (standard for these samples), in the middle and end of each etch step. No notable increase in oxygen was observed between steps. However we are evaluating if we can determine how to potentially reduce the oxygen detection limit for these samples.

MCL
MATERIALS CHARACTERIZATION LAB

PennState
Materials Research Institute