E1-10: X-ray diffraction studies of oxide semiconductors

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X-ray diffraction measurements were made to investigate the formation of oxide semiconductors on the heat treatment of elemental materials. Preliminary studies were done using Ni and Fe as the sample materials. Diffraction data of the heat treated Ni sample showed a preferred orientation consistent with NiO diffraction data indicating NiO was formed as the dominant oxide phase. Measurements made on Fe sample however showed that the heat treatment caused the formation of more complex iron oxides in addition to the semiconductor phase. Both samples showed that the heat treatment had a major influence on the lattice orientation which in turn produced different oxide forms depending on the temperature.