

## Effects of Oxidation on the Order–disorder Transition in NiPt Alloy Nano Crystals

서옥균<sup>1</sup>, 황재성<sup>1</sup>, 송다현<sup>1</sup>, 이지연<sup>1</sup>, 최정원<sup>1</sup>, 이수용<sup>1</sup>, 강현철<sup>2</sup>, 노도영<sup>1</sup>

<sup>1</sup>School of Materials Science & Engineering, Graduate program of Photonics and Applied Physics & Department of Nano-bio materials electronics, GIST,

<sup>2</sup>Department of Advanced Materials Engineering, Chosun University

The effects of oxidation on the order-disorder transition in NiPt bimetallic alloy crystal have been investigated using in-situ synchrotron x-ray scattering technique. The temperature dependence of the crystal structure and the order parameter were measured during in-situ heating and cooling under vacuum and oxygen environments. The order-disorder transition temperature of NiPt alloy crystals in vacuum was between 615°C and 627°C. On the other hand under oxygen environment, the transition temperature decreases by about 31°C after the oxidation. The change of the transition temperature can be explained by the formation of NiO crust on the surface of NiPt crystal, which alters the composition of the Ni and Pt atoms. Since the transition temperature depends sensitively on the Ni-Pt composition, the transition temperature changes as Ni atoms diffuse out to form NiO.

**Keywords:** Order-disorder transition, Bimetallic alloy