

## A Study on the Surface Oxidation Behavior of Cube-textured Nickel Substrate

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We investigated the surface oxidation behavior of cube-textured polycrystalline nickel at various oxidation conditions. Cube-textured NiO film was formed on a cube-textured polycrystalline nickel regardless of oxidation conditions but different growth behavior of NiO crystals was observed depending on the oxidation conditions. The introduction of water vapor into O<sub>2</sub> did not affect on the texture evolution but rough and porous microstructure was developed. Microstructure of NiO film tends to be denser as the oxygen partial pressure is increased. It is interesting that (111) plane crystal grew favorably in the substrate oxidized in air atmosphere while (200) plane was major in the substrate oxidized in high purity argon gas. Small amount of high index crystallographic plane NiO crystal was formed when N<sub>2</sub>O was used as an oxidant while only (200) plane crystal was formed in dry O<sub>2</sub> atmosphere. Flat and smooth surface was changed into rough faceted one when oxidation rate was faster. The crystal size of NiO was decreased when the oxygen partial pressure was low. It was also observed that the modification of nickel surface suppressed the development of (200) texture.

keywords : NiO, Ni, cube-texture, oxygen partial pressure

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