## Structure Analysis of Crystal Grain nearby Surface using X-ray Scattering at Small Glancing Angle of Incidence

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When X-rays are applied to the material surface at a grazing angle of incidence, the intensity of X-rays scattered on the surface is the sum of the X-rays that scattered by the atoms only on the surface, ca. several ten atomic layers deep, and the contribution of the atoms of each depth to the X-rays intensity varies on the incidence angles.

Since the penetration depth of X-rays changes by changing an incidence angle, a structural change of the depth direction of a material surface layer can be known in analyzing incidence angle dependence of the information that the scattered X-rays have.

We derived the x-ray intensity propagating during the surface layer materials that are characterized with complex refractive index, which changes continuously in depth, and studied analyzing method for evaluating the distribution of grain size of the crystal in the surface layer of material by using x-ray diffraction at small glancing angle incidence.

Intensities of the diffracted x-rays on polycrystalline iron surface were measured continuously at the various incidence angles, and the dependency of the incidence angles was investigated.

Keywords: surface x-ray scattering, polycrystalline x-ray diffraction, grazing incidence diffraction