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# Blurring behavior of a fingerprint on Hierarchical Nanoporous Layer glass.

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## Abstract

Hierarchical Nanoporous Layer (HNL) glass is a functional material which has nanoporous structure on its surface. The HNL is simply formed by alkaline etching of a silicate glass. Optical low-reflectivity and long-life super-hydrophilicity which results in anti-fogging, anti-fouling and so on characterize the HNL glass. Furthermore, we have recently found a phenomenon that fingerprint attached on a HNL glass gradually gets indistinct. In order to elucidate the mechanism of the phenomenon, we conducted an IR absorption spectroscopy and an optical micrograph analysis.

The IR measurement was performed for a centimeter-size spot on HNL glass with and without fingerprints, that provides an averaged value for the relatively large area in comparison with a fingerprint pattern. The obtained spectrum for a fingerprint-attached HNL glass was different from unattached one and did not change even after the fingerprint got indistinct. This indicates the total amount of organic substance in the fingerprint was unchanged. The fingerprint was not decomposed and indicated to rapidly diffuse on the HNL.

We then analyzed optical micrographs to evaluate the speed of the blurring and the diffusion constant. The environmental dependence like humidity will also be discussed.

**Keywords:** fingerprint, surface diffusion, porous structure

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