

# Synthesis and photoreactivity of polyamide containing mesogens in the side chain

by

**Keisuke INABA<sup>\*1</sup>, Masataka MOCHIZUKI<sup>\*1</sup>, Takahiko SAKAMOTO<sup>\*2</sup>,  
Yu NAGASE<sup>\*3</sup>, Eiichi AKIYAMA<sup>\*4</sup>**

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## Abstract

As an attempt to align the side chain liquid crystalline (LC) group by the anisotropic photoalignment of an aromatic polyamide surface, we propose new types of aromatic polyamides containing LC groups in the side chain. Three kinds of polyamides having 4'-cyanobiphenyl mesogen with different spacer lengths have been synthesized. 4'-cyanobiphenyloxyalkyl 3,5-diaminobenzoates, diamine monomers which possessed ethyl, hexyl, and undecyl groups as the alkyl component, were prepared by means of esterification of 3,5-dinitrobenzoyl chloride with 4'-cyanobiphenyloxy alcohol compounds, followed by catalytic reduction of the two nitro groups. The aromatic polyamides were prepared by polycondensation of the diamine monomers with 4,4'-dicarboxydiphenyl ether. The obtained polymers exhibited a glassy state without mesophase. The fluorescence spectra of the polymer films were measured, in order to confirm that a photoreaction took place on the film surface. The results showed that the luminescence intensity of the polyamide was decreased by the irradiation of UV light. Therefore, such polyamides containing LC groups could possibly enable an anisotropic photoreaction on a film surface subjected to polarized UV irradiation, which would induce the alignment of the side-chain LC group.

**Keywords:** *Aromatic polyamide, Side-chain polymer liquid crystal, Fluorescence spectra, Photoreaction.*

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\*1 Graduate Student, Course of Applied Chemistry

\*2 Graduate Student, Course of Applied Chemistry

\*3 Professor, Department of Applied Chemistry

\*4 Group Leader, Sagami Chemical Research Center