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Nonlinear optical Spectroscopy of Polyimide Surface for homeotropic liquid crystal alignment MASAHITO OH-E, HIROSHI YOKOYAMA, Yokoyama Nano-structured LC Project, ERATO; LC Nanosystem, SORST, Japan Science and Technology Agency, DOSEOK KIM, Department of Physics, Sogang University — Surface–specific sum–frequency vibrational spectroscopy and second–harmonic generation were used to study the structures of polyimide (PI) surfaces for homeotropic liquid crystal (LC) alignment and the molecular orientation of LC adsobates on these surfaces. The imide ring was perpendicular to the surface with one of CO bonds protruding out of the surface and the other pointing into the bulk rather than flat on the surface. The ester CO bond in the side chain was sticking out of the surface with a tilt angle of about 40–55° from the surface normal, indicating that the rigid side chain core was, more or less, along the surface normal. The part of alkyl chain on the top of the side chain followed the orientation of the side chain core and protruded out of the surface with some gauche defects. The cyano biphenyl LC molecules were adsorbed on the PI preferentially with the terminal cyano group facing the PI surface.

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