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Intermolecular band dispersion of quasi-single crystalline organic semiconductor monolayer measured by angle-resolved photoemission spectroscopy MANABU OHTOMO, TOSHIHIRO SHIMADA, TETSUYA HASEGAWA, Department of Chemistry, The University of Tokyo — Band structure of organic semiconductors is important knowledge to improve the molecular design. Angle-Resolved Photoemission Spectroscopy (ARPES) studies using highly conductive single domain samples grown in-situ is the most direct technique. In this study, we developed a novel method to grow quasi-single crystalline monolayer on conductive substrate and electronic structure was investigated. As a template for orientation control, we used a step-bunched Si(111) substrate with dangling bond termination. In case of pentacene, it was confirmed that the crystal is quasi-single crystal with 2.2° rotated twins. The band dispersion was identical to that of thin-film phase. The effective mass and transfer integrals are evaluated using two-dimensional tight binding fit and compared with band calculations [1]. We also report the growth of 2,7-Diphenyl[1]benzothieno[3,2-b]benzothiophene (DPh-BTBT) [2] on Bi-Si substrate and compare discuss its band structure.

[1] M.Ohtomo et al., APL **95**, 123308 (2009).

[2] K.Takimiya, JACS **128**, 3044 (2006).

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