

Supporting Information for

Molecular-weight dependence of the formation of highly ordered lamellar structures in poly(*N*-dodecyl acrylamide) by humid annealing

Kazuki Ebata^a, Yuki Hashimoto^a, Kohei Ebara^b, Mayu Tsukamoto^a, Shunsuke Yamamoto^c,

Masaya Mitsuishi^c, Shusaku Nagano^d, Jun Matsui^{b}*

^aGraduate School of Science and Engineering, Yamagata University, 1-4-12 Kojirakawa-machi,
Yamagata 990-8560, Japan

^bFaculty of Science, Yamagata University, 1-4-12 Kojirakawa-machi, Yamagata 990-8560, Japan

^cInstitute for Multidisciplinary Research for Advanced Materials, Tohoku University, 2-1-1
Katahira, Aoba-ku, Sendai 980-8577, Japan

^dNagoya University Venture Business Laboratory, Nagoya University, Furo-cho, Chikusa, Nagoya
464-8603, Japan

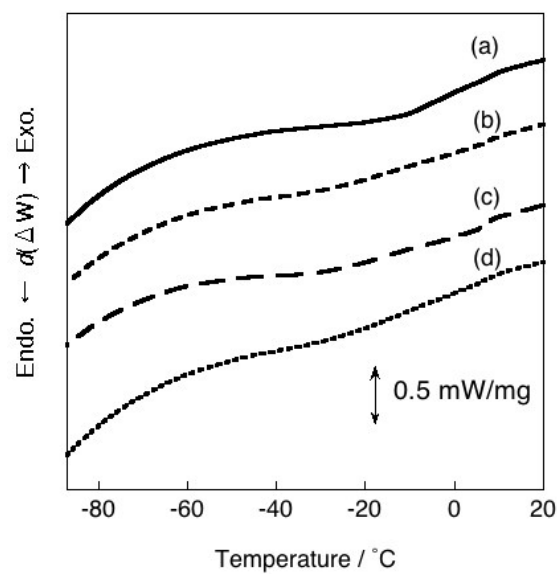


Figure S1 Third heating curve in the DSC traces of (a) pDDA_1.2k, (b) pDDA_6.6k, (c) pDDA_33k, and (d) pDDA_52k measured from -90°C

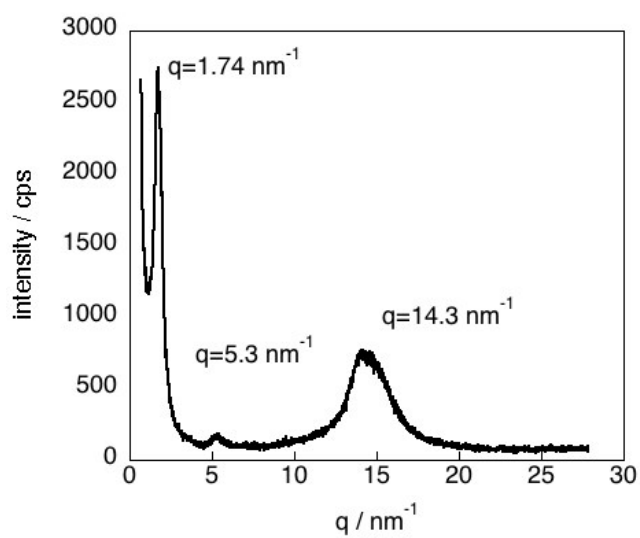


Figure S2 Powder XRD spectrum for pDDA_1.2k

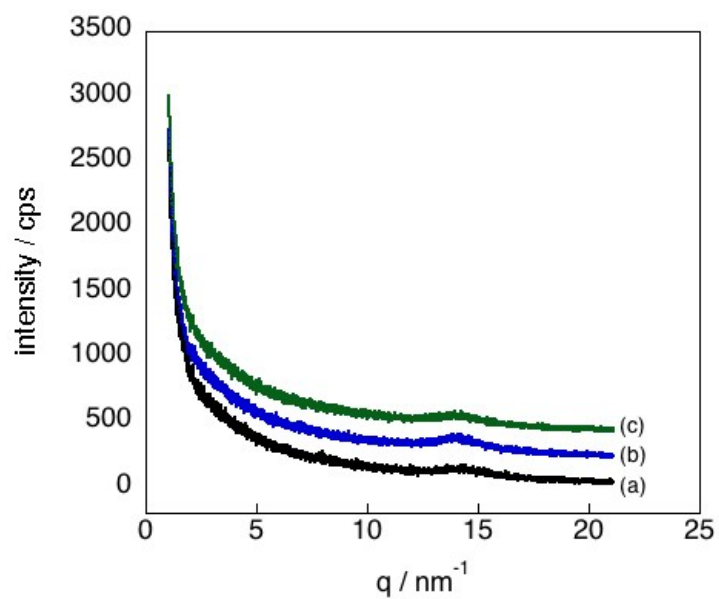


Figure S3 In-plane XRD spectra of lamellar structured film prepared from (a) pDDA_6.6k, (b) pDDA_33k and (c) pDDA_52k

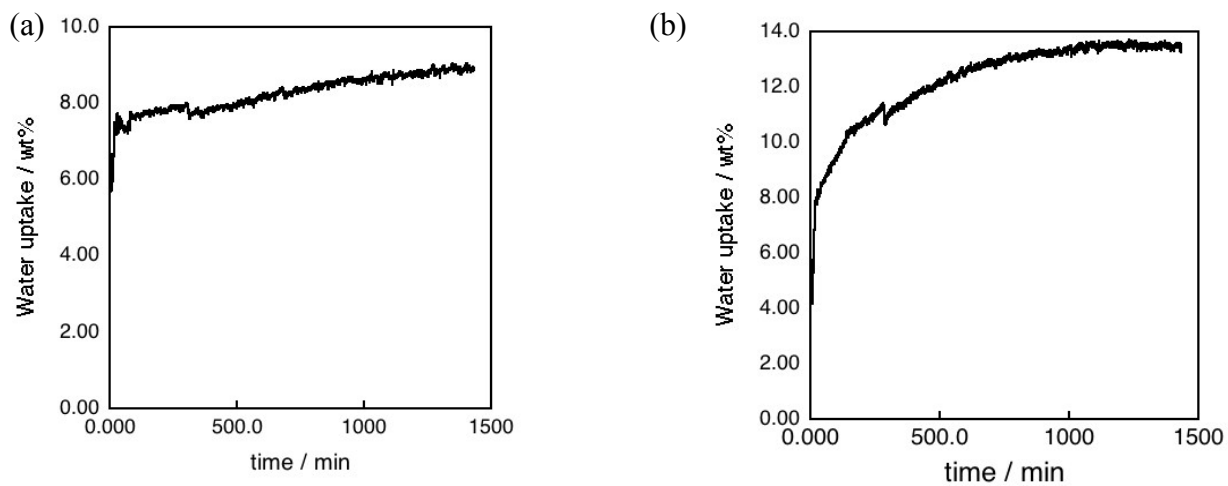


Figure S4 Water uptake dynamics for (a) pDDA_6.6k and (b) pDDA_52k

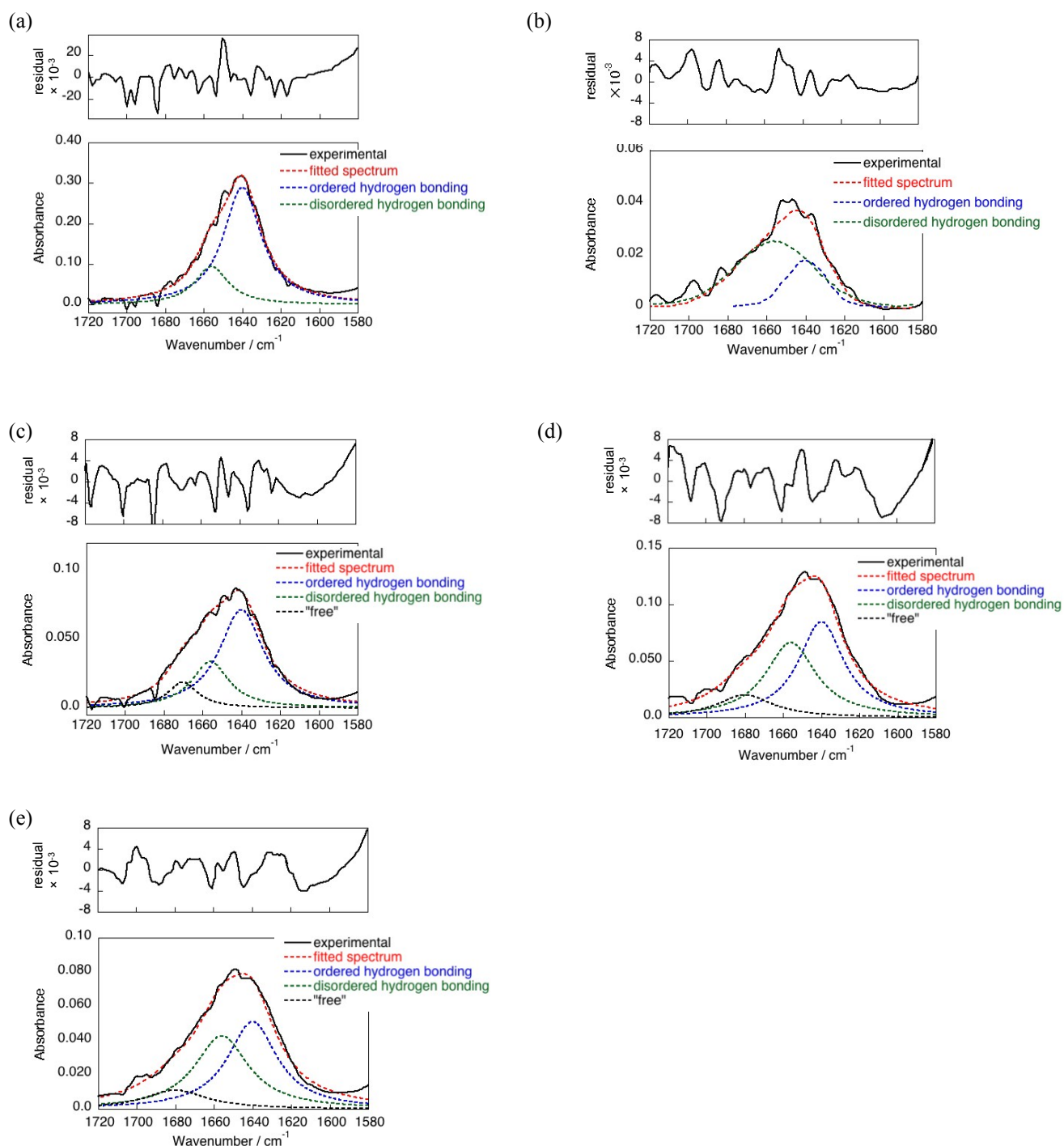


Figure S5 Deconvolution of amide I region for (a) pDDA_1.2k, (b) pDDA_3.5k, (c) pDDA_6.6k, (d) pDDA_33k and (e) pDDA_52k. Upper graph in each spectrum is the residual for the fitting results. Peak fitting was carried out by keeping the center wavenumbers at 1640 cm^{-1} (ordered hydrogen-bonded carbonyl groups), 1656 cm^{-1} (disordered hydrogen-bonded carbonyl groups) and 1680 cm^{-1} (non-hydrogen-bonded “free” carbonyl groups).

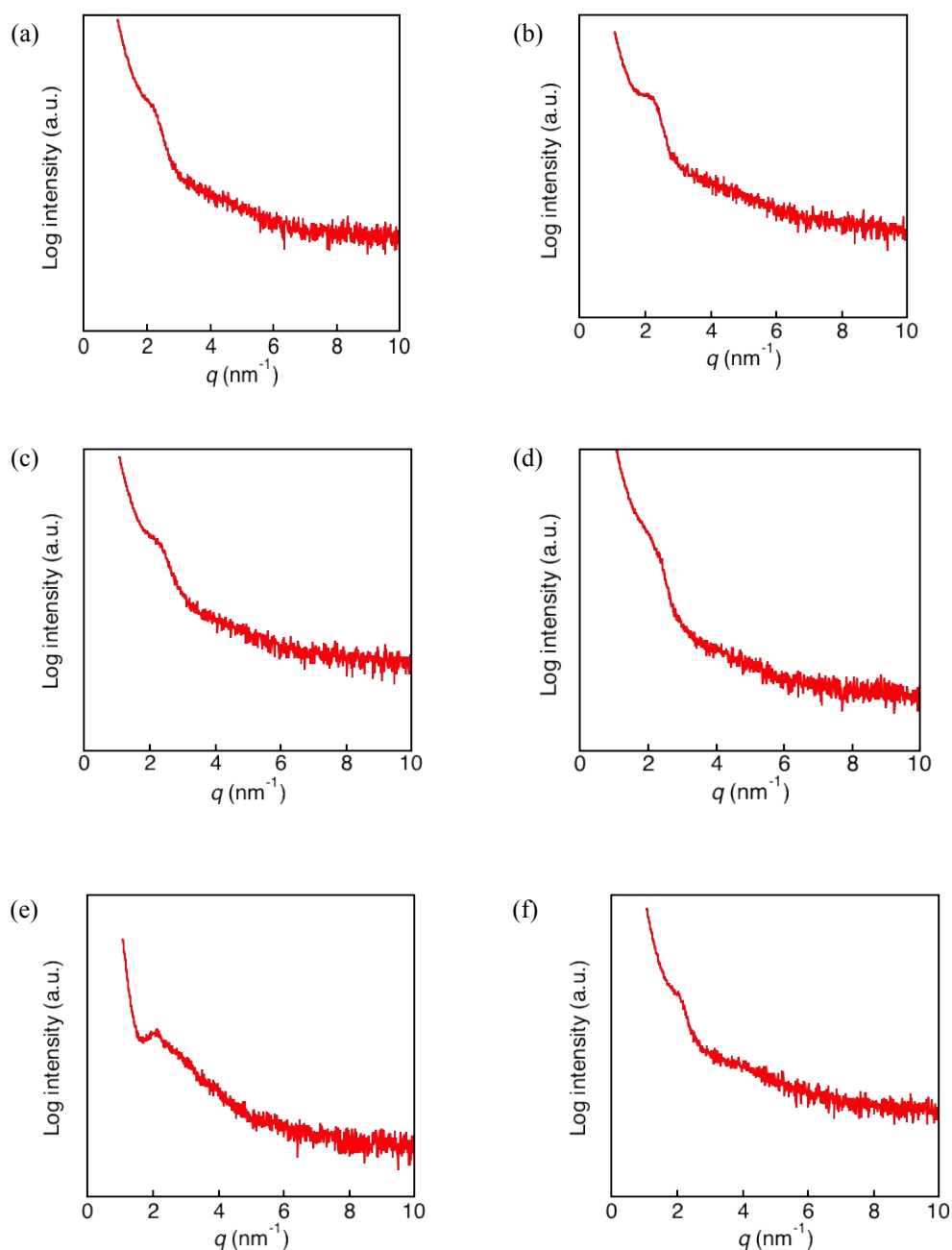


Figure S6 XRD patterns of pDDA films annealed in different organic vapor (a) hexane, (b) acetone, (c) ethyl acetate, (d) acetonitrile, (e) methanol and (f) ethanol. The annealing temperature was 60 °C, except for acetone, which was annealed at 50 °C

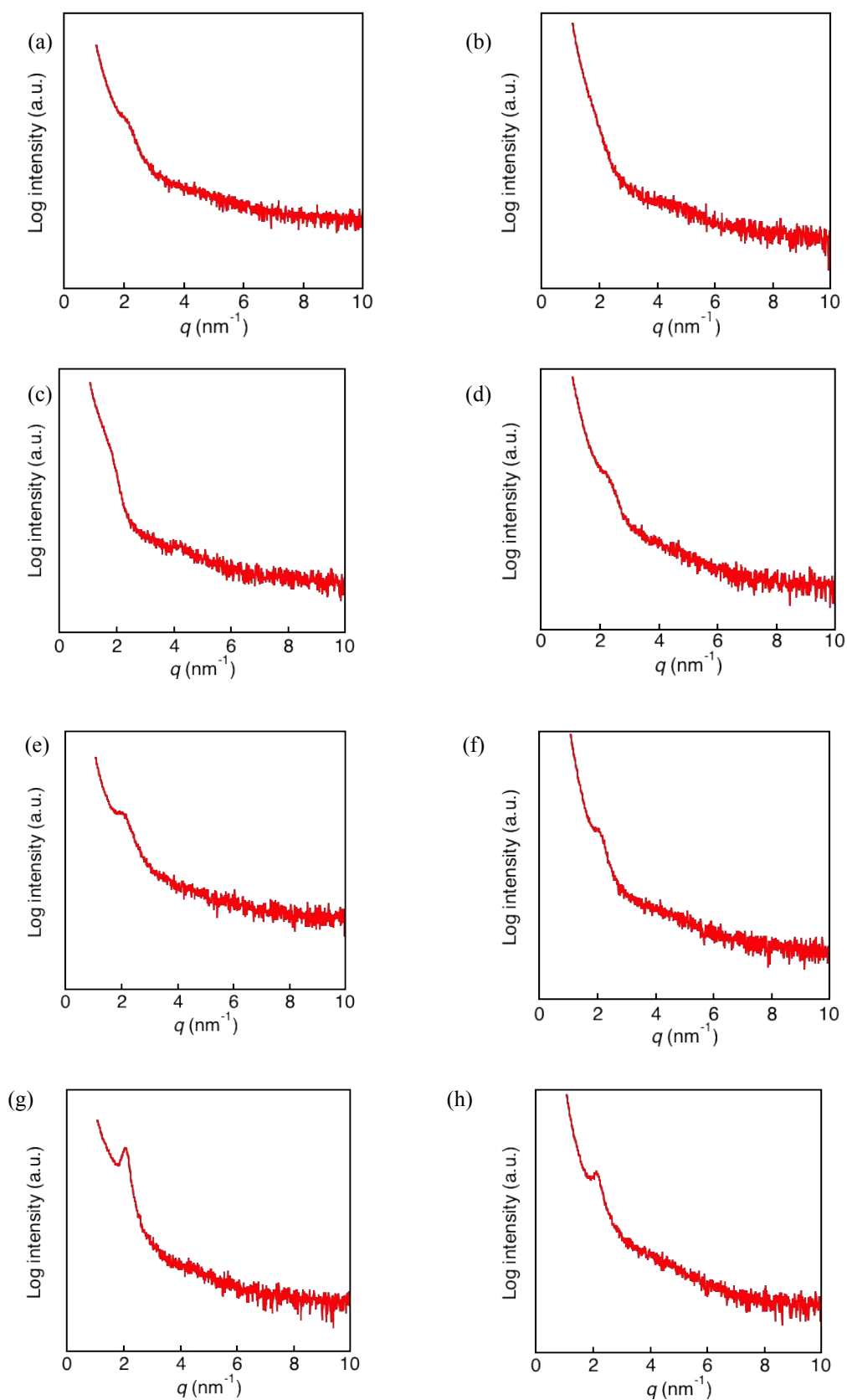


Figure S7 XRD patterns of pDDA films annealed under different organic solvent (a) hexane, (b) acetone, (c) ethyl acetate, (d) acetonitrile, (e) methanol, (f) ethanol, (g) DMF, and (h) ethylene glycol. The annealing temperature was 60 °C, except for acetone, which was annealed at 50 °C