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**Growth mechanism changes in pseudo-dewetted monolayer poly(ethylene oxide) crystallization** DUN-SHEN ZHU, ER-QIANG CHEN, AN-CHANG SHI, STEPHEN CHENG, PEKING UNIVERSITY, CHINA COLLABORATION, MCMASTER UNIVERSITY, CANADA COLLABORATION, UNIVERSITY OF AKRON, USA COLLABORATION — Crystal growth mechanism changes have been observed in pseudo-dewetted monolayers of low molecular weight (LMW) (PEO) on freshly cleaved hydrophilic mica surfaces [HPEO(4250) which have -OH groups at both ends and MHPEO(4700) which has one -OH and one -$OCH_3$ as end groups]. X-ray scattering reflectivity measurements show a wetted monolayer of molten PEO with a thickness of $\sim$ 4.5 nm on the mica surface. Non-adsorbed PEO droplets sit on top of the wetted monolayer. A two-step process for PEO single crystal growth under isothermal conditions was identified utilizing in-situ atomic force microscopy at different crystallization temperatures ($T_x$). In the first step, the crystal grows within the droplet which supplies the molten PEO that participates in the crystal formation. In this second-step, the wetted monolayer at the growth front is depleted by about 1.5 - 2.5 nm. The growing crystal lateral sizes obey a power law of $t^\alpha$ ($t$: time). At a high $T_x$ of 63 $^\circ$C for MHPEO(4700), the growth behavior obeys $r \propto t$ ($\alpha = 1$). While in the case of HPEO(4250), its growth behavior follows $r \propto t^{0.5}$ ($\alpha = 0.5$) in the whole $T_x$ range. With decreasing $T_x$, the growth of MHPEO(4700) falls into a scaling law of $r \propto t^\alpha$ ($0.5 < \alpha < 1$).

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