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STM study of C_{70} and C_{60}/C_{70} mixture on Ag(100) WOEI WU PAI, L. Y. MANDY SIN, C. H. LIN, Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan, R.O.C. — The adsorption structure of C_{60} on Ag(100) is a very interesting one because it is a uniaxial incommensurate aperiodic (111) phase with extensive adsorbate-induced reconstruction [1]. Peculiar molecular ordering arises therein due to delicate balance of competitive interactions. In contrast, few adsorption studies were conducted for the next abundant fullerene, C_{70}, which has an ellipsoidal shape. We have recently studied C_{70} and C_{60}/C_{70} mixtures of controlled ratios on Ag(100). We compare structures and molecular ordering of these two systems to that of C_{60}/Ag(100), and seek possible structural phase transitions therein. Our results show that C_{70}/Ag forms a commensurate phase i.e., c(6×4). The mixture adlayers evolve from c(6x4) to (111) with increasing C_{60} ratios, as evidenced by low energy electron diffraction. In many cases, unidirectionally aligned bright lines were observed, e.g., at a C_{60}:C_{70} ratio of 2:1. Such ordering cannot be explained by the model developed for C_{60}/Ag, and thus its origin remains controversial. Sequential deposition of C_{60} and C_{70} shows that C_{60} intermix readily into the C_{70}layer but not vice versa. This behavior suggests that kinetics of fullerene diffusion and intermixing may be crucial to determine the mixture structure. [1] W. W. Pai and C. L. Hsu, Phys. Rev. B **68**, 121403 (2003); *ibid.* **68**, 245414 (2003)

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