

Abstract Submitted
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Monte Carlo Study of the Fish-like Patterns of Anthracenes on Cu(111)¹ KWANGMOO KIM, T.L. EINSTEIN, University of Maryland, College Park, DEZHENG SUN, DAE-HO KIM, LUDWIG BARTELS, University of California, Riverside — Using Monte Carlo calculations of the two-dimensional triangular lattice with a 2-component 3-state Potts model, we demonstrate a mechanism for the spontaneous formation of fish-like patterns of anthracene (AC) molecules on Cu(111) by sputtering and annealing, then cooling to ~ 80 K. The two components are an AC on a hollow site and another on a bridge site of Cu(111).² The liquid crystal model with two separate parts, positional and orientational, only explains a part of the fish-like pattern, not the whole regular pattern. Our model fixes the positional order of AC's into the triangular lattice and the orientational order into three angles as observed in the experiments. The variation of the coverages of AC's is reflected in the change of the ratio of two components in our model. We also try to understand the compression of AC's with the introduction of Gaussian dispersion of AC's about their triangular lattice sites.

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Kwangmoo Kim
University of Maryland, College Park

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