

Abstract Submitted
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Monomer Adsorption on 6-Atoms Wide Zigzag (111) Terraces¹

ALAIN PHARES, Villanova University, DAVID GRUMBINE, JR, St. Vincent College — We study monomer adsorption on six-atoms wide, zigzag (111) terraces, with first- (V), second- (W), and third-neighbor (U) interactions, specializing to repulsive first-neighbors. All possible crystallization patterns, or phases, that may exist are expected to occur at relatively low temperatures. Under these conditions, the energy phase diagram is three-dimensional and depends on the dimensionless variables, $v = \mu/|V|$, $u = U/|V|$, and $w = W/|V|$. The chemical potential energy of the monomers, μ , in the medium to which the terrace is exposed depends on the pressure, if the medium is a gas, or the concentration if the medium is solution. There are 95 phases, or crystallization patterns, of the adsorbates with coverages ranging from $1/5$ to $8/9$. In particular, we find that there are 10 distinct $1/2$, $2/3$, and $4/9$ coverage phases, and 9 distinct $1/3$ coverage phases.

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Alain Phares
Villanova University

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