Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Molecular nanostructures on graphite ANDREAS RIEMANN, LINDA GRABILL, BRANDON OWENS, ERIC KREBS, Western Washington University — The self-assembly of different amino acids on graphite has been studied using Scanning Tunneling Microscopy. Experiments involving the amino acid methionine have shown that the molecules arrange themselves in well-ordered molecular wires with equidistant spacing tunable by the amount of adsorbate concentration on the surface. This behavior can be explained by an attractive interaction of the amino and carboxyl groups with each other, whereas the side chains exhibit repulsive interactions. Experiments using other amino acids with different side chains, like tyrosine and histidine, show adsorption behavior which lead to densely packed films of well-ordered amino acids, but no molecular wire structure. The repulsive interactions of the side chains can not be experimentally observed. This interesting phenomenon of inter-molecular interaction was further investigated using molecular mechanics calculations for these molecules.

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Date submitted: 09 Nov 2011 Electronic form version 1.4