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Chiral molecule for spin filtering purposes: the study of L- and D-Alanine[1] ESMERALDA YITAMBEN, Center for Nanoscale Materials, Argonne National Laboratory, Argonne, IL 60439, RICHARD ROSENBERG, Advanced Photon Source, Argonne National Laboratory, Argonne, IL 60439, NATHAN GUISINGER, Center for Nanoscale Materials, Argonne National Laboratory, Argonne, IL 60439 — The field of molecular electronics has attracted scientists by the great opportunities and versatility it offers as a replacement for standard semiconductor electronics with organic materials, thus bringing down the cost, and opening endless possibilities for chemical synthesis, and scientific breakthrough. Of particular interest is the use of chiral molecules, such as alanine, for spin filtering studies in hope of creating highly spin-polarized charge carriers for spintronics applications. Preliminary studies of both L- and D-alanine on Cu(111) were conducted using scanning tunneling microscopy and spectroscopy, revealing the formation of a 2-dimensional phase at low coverage, a hexagonal "flower" pattern at intermediate coverage, and a chain and ring superstructures at high coverage. A model is proposed to explain the surface chemistry and bonding of the molecules on the metallic surface. Current studies of L- and D-alanine on Fe/W show promises in the intermediate coverage regime.

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