

Abstract Submitted
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Investigation of the Effects of Atomic Number and Constitution on Chirally-Sensitive Electron-Induced Molecular Breakup JOAN DREILING, Univ of Nebraska - Lincoln, FRANK LEWIS, Northumbria University, TIMOTHY GAY, Univ of Nebraska - Lincoln — We present the results of our search for asymmetric interactions between longitudinally spin-polarized electrons and different chiral halocamphor molecules. We define the asymmetry as $A = [(I_{\uparrow} - I_{\downarrow})/(I_{\uparrow} + I_{\downarrow})]_{L-} [(I_{\uparrow} - I_{\downarrow})/(I_{\uparrow} + I_{\downarrow})]_{R}$, where I_{\uparrow} (I_{\downarrow}) is the current measured for spin-up (spin-down) electrons and the “ L ” and “ R ” subscripts correspond to the left- and right-handed chirality of the molecules [1]. Two electron-molecule interaction channels were studied: electron transmission (related to the total scattering cross section) and dissociative electron attachment (DEA). Three halocamphor molecules were investigated: 3-bromocamphor ($C_{10}H_{15}BrO$), 3-iodocamphor ($C_{10}H_{15}IO$), and 10-iodocamphor. While the transmission asymmetry data do not show a strong molecular dependence, the DEA asymmetries collected for bromocamphor and iodocamphor are qualitatively different, suggesting that the atomic number of the heaviest atom in the molecule plays a crucial role in the asymmetric interactions. The DEA asymmetry data for 3- and 10-iodocamphor have the same qualitative behavior, but the 10-iodocamphor asymmetry is about twice as large at the lowest energies investigated, so the location of the heavy atom in the camphor molecule also affects the asymmetries. [1] J.M. Dreiling and T.J. Gay, Phys. Rev. Lett. **113**, 118103 (2014).

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