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Large Molecules Reveal a Linear Length Scaling for Double Photoionization[1] RALF WEHLITZ, TIM HARTMAN, PAVLE JURANIĆ[2], SRC, Univ. of Wisconsin - Madison, KELLY COLLINS, Univ. of Evansville, BETHANY REILLY, Univ. of Wisconsin - Madison, NARAYANA APPATHURAI, SRC, Univ. of Wisconsin - Madison — We have determined the ratio of doubly-charged to all parent ions of partially deuterated benzene, naphthalene, anthracene, and pentacene up to 30 eV above their double-ionization thresholds. These ratios increase linearly with the length of the molecule.[3] This means that the general structure (here: the length) of a molecule can have a significant influence on the ratio and that the origin of the two emitted electrons can be as far apart as the length of the molecule. Moreover and quite surprisingly, the overall energy dependences of the molecules' ratios are very similar to that of He and the structure of these molecules does not affect the shape of the energy dependence of the ratio. We interpret this as direct evidence for the validity of the knock-out model even for large molecules and not just for atoms. We want to mention that the increase of the ratio may not only be valid for molecules of increasing lengths but also for molecules that increase in size in two dimensions such as pyrene and coronene.

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