

## **Descriptions of Additional Supplementary Files**

### **Supplementary Data**

**Description:** Excel spreadsheet containing all energy decomposition analysis, and kinetic energy decomposition analysis data. The origin of the covalent H-H bond is understood as driven by kinetic energy lowering. Here the authors show this is not the case for bonds between heavier elements likely due to the presence of core electrons, and that constructive wavefunction interference instead drives bond formation.