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Polymeric CO: A new class of High Energy Density Material
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Covalently bonded extended phases of molecular solids made of first- and second-row elements at high pressures are a new class of material with advanced optical, mechanical and energetic properties. The existence of such extended solids has recently been demonstrated using diamond anvil cells in several systems, including N2, CO2, and CO. However, the microscopic quantities produced at the formidable high-pressure/temperature conditions have limited the characterization of their predicted novel properties including high-energy content. Here we present the first experimental evidence that these extended low-Z solids are indeed high energy density materials via milligram-scale high-pressure synthesis, recovery and characterization of polymeric CO (p-CO). This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

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