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**Extended Solids of Carbon Monoxide formed from  $\text{Re}_2(\text{CO})_{12}$**

JENNIFER CIEZAK-JENKINS, US Army Research Laboratory — Extended solids are formed from simple molecular gases under extreme P/T and are of considerable interest as high-energy-density materials. It has been postulated that a transformation from a single-bonded polymeric-like material back to the more stable triply-bonded diatomic phase would be a highly exothermic process yielding large amounts of energy. The extended polymeric solid of CO was first reported and recovered from high pressure conditions in 2005 [1]. Although the material was found to have potentially interesting energetic properties, it showed a number of stability issues, degrading into  $\text{CO}_2$  and graphitic carbon over 3 to 5 days. As such, our lab has been focused on the identification of methods to increase the metastability of the recovered solid. Metal carbonyls offer one such route for stabilization. In this talk, our progress in the study of the synthesis, characterization, and recovery of extended solids of CO starting from  $\text{Re}_2(\text{CO})_{12}$  to pressures near 50 GPa will be presented. I will discuss the analysis and the implications of these results. New opportunities and challenges that have arisen in the course of our studies that will be pursued in the future will also be presented. Ref [1] Lipp, M. J.; et al. Nat. Mater. 2005, 4 (3), 211-215.

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