

Abstract Submitted  
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**Graphene-like Networks in the lattice of Ag, Cu and Al metals** LOURDES SALAMANCA-RIBA, XIAOXIAO GE, ROMAINE ISAACS, HM IFTEKAR JAIM, MANFRED WUTTIG, SERGEY RASHKEEV, MAIJA KUKLJA, LIANBING HU, University of Maryland, COVETICS TEAM TEAM — Graphene-like networks form in the lattice of metals such as silver, copper and aluminum via an electrocharging assisted process. In this process a high current of  $>80\text{A}$  is applied to the liquid metal containing particles of activated carbon. The resulting material is called M covetic ( $M=\text{Al, Ag Cu}$ ). We have previously reported that this process gives rise to carbon nanostructures with  $\text{sp}^2$  bonding embedded in the lattice of the metal. The carbon bonds to the metal as evidenced by Raman scattering and first principles simulation of the phonon density of states. With this process we have observed that graphene nanoribbons form along preferential crystalline directions and form 3D epitaxial structures with Al and Ag hosts. Bulk Cu covetic was used to deposit films by e-beam deposition and PLD. The PLD films contain higher C content and show higher transmittance ( $\sim 90\%$ ) and resistance to oxidation than pure copper films of the same thickness. We compare the electrical and mechanical properties of covetics containing C in the 0 to 10 wt % and the transmittance of Cu covetic films compared to pure Cu films of the same thickness. Supported by ONR grant N000141410042

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