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**Detailed line shape analysis of the C KVV Auger peak of two carbon allotropes measured using a time of flight positron annihilation induced Auger electron spectrometer**[1] A J FAIRCHILD, V A CHIRAYATH, M D CHRYSLER, R W GLADEN, S K IMAM, A R KOYMEN, A H WEISS, Univ of Texas, Arlington — We report a detailed line shape analysis of the positron induced C KVV Auger line shape from highly oriented pyrolytic graphite (HOPG) and a single layer of graphene grown on polycrystalline Cu. A model consisting of the self-fold of the one-electron density of states including terms for hole-hole interactions, charge screening effects, and intrinsic loss mechanisms is compared to experimental C KVV line shapes measured using a positron induced Auger electron spectrometer (PAES). In traditional Auger spectroscopies which use an electron or photon to initiate the Auger process, extracting the relatively small Auger signal from the large secondary background can be quite difficult. Using a very low energy positron beam to create the core hole through an anti-matter matter annihilation entirely eliminates this background. Additionally, PAES has sensitivity to the top most atomic layer since the positron becomes trapped in an image potential well at the surface before annihilation. Therefore, the PAES signal from a single layer of graphene on polycrystalline Cu is primarily from the graphene overlayer with small contributions from the Cu substrate while the PAES signal from HOPG can be viewed as a single graphene layer with a graphite substrate. The influence of these two substrates on C KVV line shape is discussed.

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