Abstract Submitted
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Positron spectroscopy of 2D materials using an advanced high intensity positron beam[1] A MCDONALD, V CHIRAYATH, Z LIM, R GLADEN, M CHRYSLER, A FAIRCHILD, A KOYMEN, A WEISS, Univ of Texas, Arlington — An advanced high intensity variable energy positron beam(˜1eV to 20keV) has been designed, tested and utilized for the first coincidence Doppler broadening (CDB) measurements on 6-8 layers graphene on polycrystalline Cu sample. The system is capable of simultaneous Positron annihilation induced Auger electron Spectroscopy (PAES) and CDB measurements giving it unparalleled sensitivity to chemical structure at external surfaces, interfaces and internal pore surfaces. The system has a 3m flight path up to a micro channel plate (MCP) for the Auger electrons emitted from the sample. This gives a superior energy resolution for PAES. A solid rare gas(Neon) moderator was used for the generation of the monoenergetic positron beam. The positrons were successfully transported to the sample chamber using axial magnetic field generated with a series of Helmholtz coils. We will discuss the PAES and coincidence Doppler broadening measurements on graphene –Cu sample and present an analysis of the gamma spectra which indicates that a fraction of the positrons implanted at energies 7-60eV can become trapped at the graphene/metal interface.

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