Characterization of a-C/B:H thin films for KSTAR boronization

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KSTAR vacuum vessel has been boronized by carborane (C2B10H12) to reduce various kinds of impurities including carbon and oxygen from the wall, since carborane is solid, non-toxic, non-explosive and is easily evaporated, while diborane (B2D6) is toxic and explosive. To find the best wall condition for the removal of contaminants before application to KSTAR, various amounts (0.3g, 0.5g, 1g) of carborane are tested in a test chamber, where filament discharge was generated in the mixture of helium and carborane with the same KSTAR target pressure (~5 mTorr) from base pressure (~10^-7 Torr). Discharge is performed by a pulse sequence mode with 3 second power on and 5 second power off. Deposited films of a-C/B:H are characterized by ellipsometry, AES and XPS, and are compared with those of KSTAR.

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