

Formation dynamics of UV and EUV induced hydrogen plasma

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The comparative study of the dynamics of ultraviolet (UV) and extreme ultraviolet (EUV) induced hydrogen plasma was performed. It was shown that for low H₂ pressures and bias voltages, the dynamics of the two plasmas are significantly different. In the case of UV radiation, the plasma above the photocathode appears after UV pulse due to electron avalanche, after which discharge structure formation begins. In contrast, for EUV-induced plasma, a spatial discharge structure is formed immediately during radiation pulse through intensive gas ionization. This difference explains why EUV-induced plasmas are much denser at low

pressures (less than 10 Pa) and bias voltages (less than 50V). However, at pressures above 30 Pa EUV and UV induced plasmas show similar volt-ampere characteristics. This means that, in certain cases, plasma-chemistry in presence of EUV-induced plasma can be predicted from UV induced plasma experiments