

Abstract Submitted
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Generation of surface preparation species in an Ar+H₂ plasma discharge KOSTYA (KEN) OSTRIKOV, Plasma Nanoscience, The University of Sydney, HYUN-JIN YOON, PDP Technology Research Center, Pusan National University, AMANDA RIDER, Plasma Nanoscience, The University of Sydney — Deposition surfaces must be carefully prepared before nanoassembly can take place. Therefore, understanding how the surface preparation species or ‘working units’ (WUs), responsible for surface activation and passivation are generated in a plasma discharge is an important step towards creating reliable and robust plasma-aided nanofabrication methods [1,2]. Here, a two-dimensional fluid simulation of the number densities of WUs in a low-temperature, low-pressure, non-equilibrium Ar+H₂ plasma is conducted. Parameters such as operating pressure, H₂ partial pressure and power were varied in order to observe the effect on production of the argon ion and atomic hydrogen, species responsible for surface activation and passivation respectively. Delicate balances are required between these parameters in order to ensure high number densities of Ar⁺ and H species, and thus to achieve acceptable rates of surface activation and passivation. This paper contributes to the improvement of the controllability and predictability of plasma-based nanoassembly processes. [1] K. Ostrikov et al, Plasma Process. Polym. 4, 27 (2007) [2] K. Ostrikov, Rev. Mod. Phys. 77, 489 (2005)

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