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Fluid simulation of feedstock gas transporting properties in argon inductively coupled plasmas SHU-XIA ZHAO, CHENG CHEN, ZHAO FENG, YOU-NIAN WANG, Dalian University of Technology, PSEG TEAM[1] — The flow properties of feedstock gas in an argon inductively coupled plasma are investigated by compressible Navior-Stocks equation. The inlet gas flow rate and outlet fixed pressure are adjusted in their respective parameter ranges, 50-1000sccm and 20-1000mTorr. The axial symmetry and no-slip wall boundary condition are applied at the reactor axis and walls, respectively. Multi reactor configurations are derived from the realistic industry application. The results show that the gas flow velocity almost linearly increases with gas flow rate since high flow rate can result in high inlet gas velocity. The gas velocity still decreases at high outlet pressure due to the fact that the density is high at high pressure and hence the velocity drops at constant inlet mass flux density. At all considered cases, the gas is compressible, especially at the sidewall, as the gas flow rate is high and pressure is low enough. Last, the aspect ratio of reactor has significant influence on both the magnitude and profile of gas velocity.

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