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VUV Photon Fluxes from Microwave Excited Microplasmas at Low Pressure PENG TIAN, University of Michigan, MARK DENNING, RANDALL URDHAL, Agilent Technologies, MARK J. KUSHNER, University of Michigan — Microplasmas in rare gases and rare gases mixtures can provide efficient and discretely tunable sources of VUV light. Microwave excited microplasma sources excited by a split-ring resonator antenna in rare gas mixtures operated in ceramic cavities with sub-mm dimensions have been developed as discretely tunable VUV sources for chemical analysis. Controlling wavelengths and the ratio of ion to VUV fluxes are important to achieving chemical selectivity. In this paper, we will discuss results from an investigation of scaling laws for the efficiency of VUV photon production in rare gas mixtures. The investigation was performed using a hydrodynamics model where the electron energy distribution and radiation transport are addressed by Monte Carlo simulations. Plasma density, VUV photon production and fluxes from the cavities will be discussed for mixtures of Ar, He, Xe, Kr, and as a function of power format (pulsing, cw), pressure and cavity sizes.

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