

Stability region studies of CO₂ gas laser mixture RF capacitive discharges

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Abstract. Results on the stability regions of alpha (α) to gamma (γ) transition for CO₂ gas laser mixture 3He:1CO₂:1N₂ RF capacitive discharges with and without the addition of Xe are presented in terms of current, voltage and power characteristics. Measurements have also been made of the mean electron energy, neutral gas temperature and time averaged visible emission for different electrode separations, frequencies and intermediate pressures. It is found that the Xe addition has increased the neutral gas temperature and transition input power, while it has decreased the mean electron energy and transition voltage. The time averaged visible emission has shown strong CO and NO emission from the discharge.

PACS. 52.80.-s Electric discharges – 52.80.Pi High-frequency discharges – 52.80.Tn Other gas discharges