

Excitation of the 210 nm Zn II Line in a Hollow Cathode He-Ne-Zn Discharge

M. Jánossy and P. Mezei

Research Institute for Solid State Physics and Optics, Hungarian Academy of Sciences,
POB 49; H-1525 Budapest

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In a hollow cathode He-Zn discharge it was observed that addition of Ne stops laser oscillation at the 492.4 nm Zn II line and increases significantly the spontaneous intensity at the 210 nm Zn II line, which originates from the $4d^2D_{5/2}$ lower level of the laser transition. Based on a rate equation model, the cross-section of the Ne ion-Zn atom charge transfer collisions populating the $4d^2D_{5/2}$ level was determined. The cross-section $3.5 \times 10^{-15} \text{ cm}^2$ found by us is in acceptable agreement with the value $2.3 \times 10^{-15} \text{ cm}^2$ reported in the literature. This high cross-section together with existing lower level depopulation points to the possibility of obtaining laser oscillation at 210 nm in a Ne-Zn discharge.

Key words: Gas Lasers; Laser Excitation; Charge Transfer; Glow Discharges; Sputtering.

Reprint requests to M. Jánossi. Fax: 36-1 395-9278