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Title: Studies of Fluorescence from Photoexcitation of N₂ and CO₂ in the 28-100 eV Region

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Abstract: Fluorescence excitation functions produced through the photoexcitation of N₂ and CO₂ using synchrotron radiation in the range 28-100 eV have been studied. Two broadband detectors were employed to simultaneously monitor fluorescence in the 1080-3000 Å and 3000-7000 Å regions, respectively. Broad Fluorescence peaks are observed and are interpreted in terms of dissociative ionization excitation of multiple electronic states, ion states and Rydberg states converging to multiply charged N₂ and CO₂ (i.e., N₂^{m+} and CO₂^{m+} for m=1-3). We have also studied the temperature effect on the relative fluorescence yield of CO₂ in the 28-60 eV region. It was found that the VUV fluorescence yields in the 28-40 eV region increase as sample temperature increases from 295 K to 650 K suggesting that the fluorescence produced by the photon excitation of CO₂ hot bands may be important.

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