

ANALYSIS OF QUARTET AND DOUBLET STATES OF NO MOLECULE EXCITED BY GLOW DISCHARGE

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In this work, we report the fluorescence emission spectra of NO molecules excited using a low power glow discharge under different experimental conditions such as different gas pressure, buffer gases, NO concentration, discharge voltage and time evolution of Ar/NO density ratio as well. This glow discharge electronic excitation populated different high lying energy states like quartet and doublet states of NO in its proximity such as the $A^2\Sigma$ ($\nu = 2$), $b^4\Sigma$ - ($\nu = 3$), $B^2\Pi$ ($\nu = 4$) and $X^2\Pi$ ($\nu = 33 - 32$) states. Due to intersystem crossing, emission lines originating from these levels to lower lying states were recorded and spectral line assignments were performed. Observed systems included $b^4\Sigma - a^4\Pi$, $B^2\Pi - a^4\Pi$, $a^4\Pi - X^2\Pi$, $A^2\Pi - X^2\Pi$ and $X^2\Pi - X^2\Pi$. This investigation could assist in understanding the interesting features of NO molecule such as collision processes, population dynamics and energy transfer within molecules.