

Electron induced fluorescence as a tool for detecting neutral fragments

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During the electron-beam-induced deposition process, a relatively large amount of secondary and backscattered electrons with low energies is generated. These are mainly responsible for unwanted radial growth and partially for the contamination of the deposited structure. Their energies are well above the thresholds for different dissociation processes, causing the deposition of incompletely dissociated fragments of the precursor molecule. Electron-induced dissociation processes are usually studied in cross-beam experiments in the gas phase, where the produced ions are detected by means of mass spectrometry. This approach provides information on charged fragments, but not on neutral products. Electron-induced fluorescence, on the other hand, uses optical spectrometry to detect excited species, which can be neutral or charged. An example of the emission spectrum is shown in the figure.

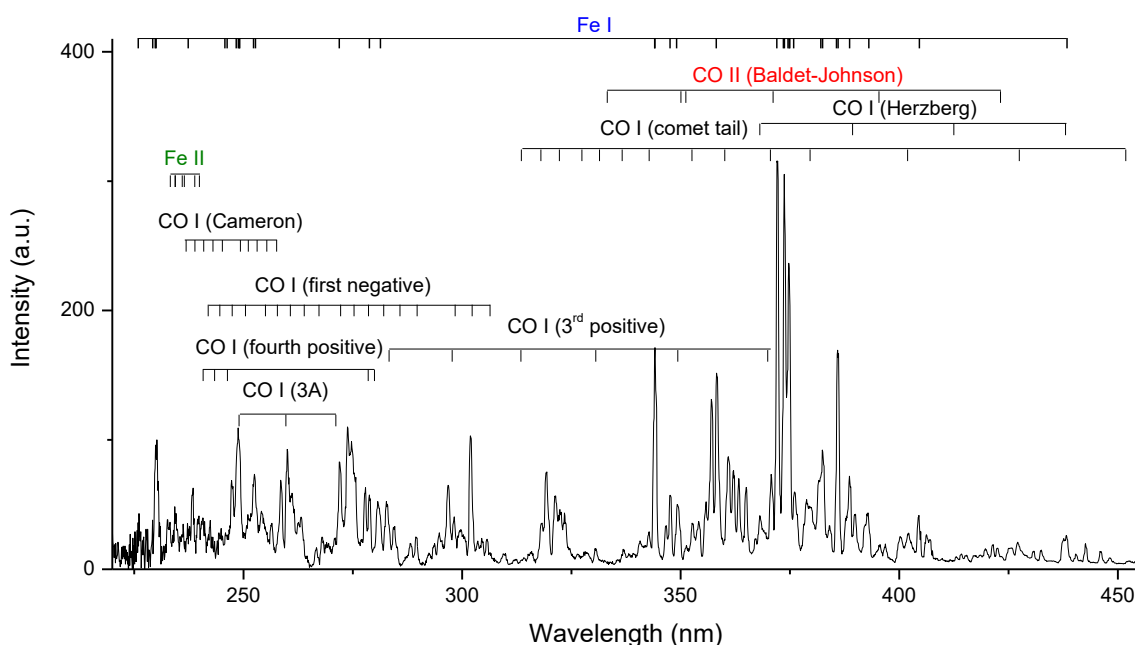


Figure 1. Spectrum of $\text{Fe}(\text{CO})_5$ at 50 eV electron impact energy.

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