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Analytical Chemistry II – Quiz (8th April, 2025)

1) Why are atomic emission methods with an ICP source better suited for multielement analysis than are flame atomic absorption methods?

Flame atomic absorption often requires a separate lamp for each element, which is not convenient when multiple elements are to be determined.

2) Why does a deuterium lamp produce a continuum spectrum rather than a line spectrum in the UV?

In a deuterium lamp, the lamp energy from the power source produces an excited deuterium molecule that dissociates into two atoms in the ground state and a photon of radiation. As the excited deuterium relaxes, its quantized energy is distributed between the energy of the photon and the energies of the two atoms. The latter can vary from nearly zero to the energy of the excited molecule. Therefore, the energy of the radiation, which is the difference between the quantized energy of the excited molecule and the kinetic energies of the atoms, can also vary continuously over the same range. Consequently, the emission spectrum is a spectral continuum.