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characteristic X-ray emission

Also contains definitions of: fluorescence excitation
of X-rays

, primary excitation
of X-rays

, secondary excitation
of X-rays

Synonym: characteristic X-radiation

X-ray emission originates from the radiative decay of electronically highly excited states of matter. Excitation by electrons is called primary excitation and by photons, secondary or fluorescence excitation. Particle induced X-ray emission (PIXE) is produced by the excitation of heavier particles such as protons, deuterons or heavy atoms in varying degrees of ionization. Emission of photons in the X-ray wavelength region also occurs from ionized gases or plasmas at high temperatures, from nuclear processes (low-energy end of the gamma-ray spectrum) and from radiative transitions between muonic states. Characteristic X-ray emission consists of a series of X-ray spectral lines with discrete frequencies, characteristic of the emitting atom. Other features are emission bands from transitions to valence levels. In a spectrum obtained with electron or photon excitation the most intense lines are called diagram lines or normal X-ray lines. They are dipole allowed transitions between normal X-ray diagram levels.

Source:
PAC, 1991, *63*, 735 *(Nomenclature, symbols, units and their usage in spectrochemical analysis - VIII. Nomenclature system for X-ray spectroscopy (Recommendations 1991))* on page 737

