

?-rays, X-ray Tube and X-ray Circuit ?A photon of EMR with energy of 59.3 keV would fall well within the ?X-ray region of the electromagnetic spectrum and would be known as ?a 'K-alpha emission'. For tungsten K-shell emission, it givesIn ?such a case, the energy of the emission arising from the interaction ?would equal the difference in binding energies between the K-orbital ?electron (69.5 keV) and the M-orbital electron (2.5 keV), i.e. approxi- ?mately 67 keV. ?It should be clear at this stage that irrespective of the energy of the ?incoming electron, provided that energy is greater than the binding ?energy of the shell-bound electron, removal of that electron will always ?lead to the production of X-rays which fall into well-defined energy ?bands. More to the ?point, useful X-rays can be produced using this process, providing the ?target material has a high enough atomic number and the tube voltage ?is above 70 KeV. Wherever a K-alpha series of characteristic ?radiations is produced in tungsten, there will always be an L-series ?of emissions and an M-series of emissions (through to the last shell). This emission would be known as a K-beta X-ray ?photon. ?2. ?3.