1.1-Introduction:

The interaction of radiation with matter provide a wealth of valuable information on radiation and shielding and biological application. The anomalous behavior at K-absorption edge of rare earth elements is important in X-ray spectroscopy, fluorescence studies and dissymmetric computation. The X-ray fluorescence (XRF) cross section and X-ray fluorescence yield values for different elements at various photo ionization energies are required in a variety of applications including atomic, molecular and radiation physics studies. At low energy photons, the interaction comprises three processes which are photoelectric effect, coherent and incoherent Compton process. Among these photoelectric absorption is the most dominant at absorption edges. The experimental attempts have been done by various workers in last two decades. Hubbell and Seltzer\(^7\) has been given theoretical values for total photon attenuation coefficient in energy range 1 keV to 20 MeV. Quantitative knowledge of the emission of characteristic K-radiation is still of great interest for both fundamental and applied physics. Vacancies in shells can be produced by charged particle impact, photo ionization, internal conversion, orbital electron capture or by higher order effects in nuclear decay. The K-shell vacancies are created by photons filled by outer electrons leading to the emission of K X-ray. In the present study, the xrf used in earth and heavy elements.

XRF analysis is a powerful analytical tool for the spectrochemical determination of almost all the elements. XRF radiation is induced when photons of sufficiently high energy from any X-ray source, impinge on a material These primary X-rays undergo interaction processes with the analytic atoms High energy photons induce ionization of inner shell electrons by the photoelectric effect and those electron vacancies in inner shell (K,L,M...) are created. The prompt
transition of outer shell electrons into these vacancies within some 100 fs cause
the emission of characteristic fluorescence radiation. Not all transition from
outer shells or subshells are allowed, only those obeying the selection rules for
electric dipole radiation. The creation of vacancy in particular shell results in
cascade of electron transitions, all correlated with the emission of photons with a
defined energy corresponding to the difference in energy between the atomic
shells involved. The family of characteristic X-ray from each element including all
transitions allows the identification of the element. Next to this radiation form of
relaxation, a competing process can take place: the emission of Auger electrons.
Both processes have Z-dependent probabilities that are complementary. The
Auger yield is high for light elements and the fluorescence yield is high for heavy
Elements.

The working principle of XRF analysis is the measurement of wavelength or
energy and intensity of the characteristic X-ray.