PHYS 321 S2022 X-ray Hwk1 Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Rydberg Constant = R = 1.097 x 107 m-1, Speed of light = c = 3.0 x 108 m/s.
Planck’s constant = h = 6.63 x 10-34J.s



1.Explain the origin of the (a) Bremsstrahlung and (b) Characteristic
lines of the x-ray spectrum.

2. The voltage across an X-ray tube is 45 kV. The tin (*Z* = 50) is the target in the X-ray tube. Determine **(a)** the tube's cutoff wavelength **(b)** the wavelength of the *Kα and Lβ* - ray lines emitted by the tin target.

3. Compute the frequency of the *Lα* x-ray line for the element with Z=73, Tantalum and compare it with Moseley’s data.

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