

Homework #7

October 20, 2009 (to be tested on Test 2, Oct. 28)

from Averill, Chapter 12: 8, 15, 16, 21, 61, 63, 67, 69

from Shackelford, Chapter 3: sample problems 8-10, 13-19; practice problems 11-14, 16-21

plus these additional questions:

1. You are operating an x-ray tube with a Cr target by applying an acceleration potential (V) of 60 kV. Draw a schematic of the x-ray spectrum emitted by this tube; label on it three characteristic λ s and give the numerical value of two of these.
2. (a) You operate the x-ray tube of part (a) at a plate voltage of 66 kV. Calculate the value of λ_{SWL} , the shortest wavelength.
(b) Sketch the emission spectrum (intensity vs wavelength) of the Ag target in part (b). On your sketch, indicate the *relative* positions of the K_α , K_β , L_α , and L_β lines and λ_{SWL} . It is not necessary to calculate the λ values of the K_β , L_α , and L_β lines.
(c) In one or two sentences explain the origin of the continuous spectrum.