**HomeWork 17**

**Due Wednesday Nov 18**

**Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_/6**

**1. The experimentally observed wavelength of light emitted by an H atom in the**

**`red’ part of the spectrum occurs at 656 nm =6.56\*10-7 m. Bohr predicts that**

**this light arises from the transition from the n=3🡪 n=2 level of his atomic**

**model.**

**Given: En = -2.18\*10\_18 J**

**n2**

**Find the predicted value for λ(m) given that hc= 1.989\*10-25 J\*m and:**

**ΔE = E3 - E2 =hc/λ(theory)**

**E3 = -2.18\*10-18/32 =-2.422\*10‑19**

**E2 = -2.18\*10-18/22 = -5.45\*10-19**

**ΔE = E3 - E2 -2.422\*10‑19 –(-5.45\*10-19)=3.028\*10-19 J**

**3.028\*10-19 = 1.989\*10‑25/λ(m)**

**λ(m) = 1.989\*10‑25/3.028\*10-19=6.569\*10-7**

**6.57\*10\_7\_\_\_=λ(theory) m**

**(3 pts)**

**2. Name two problems with the Bohr model**

**a)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_doesn’t work for any element but H\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**b)\_\_\_\_\_\_\_\_\_\_can’t explain magnetic effect on H lines (Zeeman effect)\_\_\_\_\_\_\_\_\_\_**

**3. What is the complete electronic configuration for Al ?**

**1s22s22p63s23p1**

**4. What is the abbreviated electronic configuration for Ca ?**

**[Ar] 4s2**