**Quiz 10**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. Of the two isotopes of tungsten, 160 W and 185W, one decays by β emission and one decays by α emission. Which does which? Explain (4 points).

$$for Z=40-80 the optimum\frac{n}{p} approaches 1.5$$

$$⇒ \frac{n}{p}=\frac{160-74}{74}=\frac{86}{74}=1.162, too low therefore decays via alpha emission $$

$$⇒ \frac{n}{p}=\frac{185-74}{74}=\frac{111}{74}=1.5 , is neutron rich and decays via beta emission$$

1. Write balanced nuclear equations for the following processes (8 points):
	1. Beta emission of europium-157 $\rightarrow +$
	2. Electron capture of barium-126 $+\rightarrow $
	3. Alpha emission of samarium-146 $\rightarrow +$
	4. Position emission of tantalium-165 $\rightarrow +$
2. How do chemical and nuclear reactions differ in (4 points)
	1. Magnitude of the energy change?

Chemical reactions are accompanied by relatively small changes in energy; nuclear reactions are accompanied by relatively large changes in energy.

* 1. Effect on rate of increasing temperature?

Increasing temperature increases the rate of a chemical reaction, but has no effect on a nuclear reaction.

1. What was your favorite experiment in chemistry 142 (1 point)?
2. What was your favorite topic covered in chemistry 142 (1 point)?