**Quiz 11**

# 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. What is the difference between a level of radioactivity and a dose of radioactivity (3 points)?

The level of radioactivity is the amount of radioactive particles present in a given instant of time. The dose is the accumulation of exposure over a length of time.

1. When uranium-235 nuclei are bombarded with neutrons (1.0087 amu), they can split apart in a variety of ways, like glass balls that shatter into pieces of different sizes. In one process, uranium-235 (235.04 amu) forms barium-142 (91.92 amu) and krpton-92 (141.92 amu) (12 points).
	1. Write the balanced nuclear fission equation

$$+ \rightarrow ++2 $$

* 1. Calculate the energy (in joules) released when 1.0 g of uranium-235 undergoes this fission reaction (1 amu = 1.6605 x 10-27 kg, c = 2.9987 × 108 m/s).

Δm = mproducts – mreactants

Δm = (141.92 amu + 91.92 amu + 2(1.0087 amu)) – (235.04 amu + 1.0087 amu)

Δm = 235.8674 amu – 236.0487 amu

$$Δm = -0.1913 amu×\frac{1.6605×10^{-27} kg}{1 amu}=-3.2×10^{-28}kg$$

$$∆E=mc^{2}=\left(-3.2×10^{-28}kg\right)(2.9987×10^{8}\frac{m}{s})^{2}=-2.9×10^{-11}\frac{J}{nucleus}$$

$$Number of atoms=\frac{mass of sample}{mass of one atom}$$

$Number of atoms=1.0 g U×\frac{1 kg}{1000 g}×\frac{1 amu U}{1.6605×10^{-27}kg}×\frac{1}{235.04 amu U}=2.6×10^{21} nuclei $

$$∆E=-2.9×10^{-11}\frac{J}{nucleus}×2.6×10^{21}nuclei=-7.3×10^{10} J$$

1. What is organic chemistry (3 points)?

Organic chemistry is the study of carbon and its compounds.

1. How many units are in a (2 points)
	1. monomer? \_\_\_\_1
	2. oligomer? \_\_\_\_a few