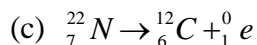
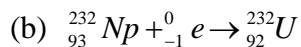
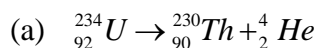


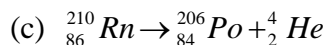
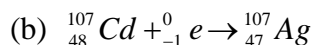
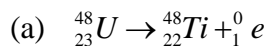
CHEM 1423
Chapters 23
Homework Solutions

TEXTBOOK HOMEWORK

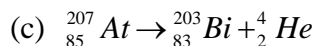
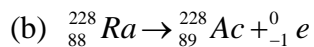
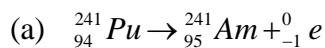
23.6 Note: To balance the nuclear equations, the total of mass numbers and charges must be equal on both sides of the equation.



23.8 Note: To balance the nuclear equations, the total of mass numbers and charges must be equal on both sides of the equation.



23.9 Note: To balance the nuclear equations, the total of mass numbers and charges must be equal on both sides of the equation.



23.12 Note: In the text HW, you are expected to calculate N/Z and then look at Figure 23.2 (pg. 769) to determine whether N/Z is above or below the stable isotope values for this atomic number, in order to determine the mode of decay. On a test, I will furnish the "typical" N/Z value for comparison.

- (a) ${}_{92}^{238}\text{U}$: $A > 83$. Therefore, the mode is α decay
- (b) ${}_{24}^{48}\text{Cr}$: $N/Z = (48-24)/24 = 1.00$. For $Z = 24$, the stable $N/Z = 1.1$. Therefore, N/Z is too low. The decay mode will be either positron decay or electron capture.
- (c) ${}_{25}^{50}\text{Mn}$: $N/Z = (50-25)/25 = 1.00$. For $Z = 25$, the stable $N/Z = 1.1$. Therefore, N/Z is too low. The decay mode will be either positron decay or electron capture.

23.13 Note: In the text HW, you are expected to calculate N/Z and then look at Figure 23.2 (pg. 769) to determine whether N/Z is above or below the stable isotope values for this atomic number, in order to determine the mode of decay. On a test, I will furnish the "typical" N/Z value for comparison.

- (a) ${}_{47}^{111}\text{Ag}$: $N/Z = (111-47)/47 = 1.36$. For $Z = 47$, the stable $N/Z = 1.2$. Therefore, N/Z is too high. The decay mode will be β decay
- (b) ${}_{17}^{41}\text{Cl}$: $N/Z = (41-17)/17 = 1.41$. For $Z = 17$, the stable $N/Z = 1.1$. Therefore, N/Z is too high. The decay mode will be β decay.
- (c) ${}_{44}^{110}\text{Ru}$: $N/Z = (110-44)/44 = 1.50$. For $Z = 44$, the stable $N/Z = 1.2$. Therefore, N/Z is too high. The decay mode will be β decay.

- 23.34** (a) ${}_{15}^{31}\text{P} + \gamma \rightarrow {}_{14}^{29}\text{Si} + {}_1^1\text{H} + {}_0^1\text{n}$
- (b) ${}_{98}^{252}\text{Cf} + {}_5^{10}\text{B} \rightarrow {}_{103}^{257}\text{Lr} + 5{}_0^1\text{n}$
- (c) ${}_{92}^{238}\text{U} + {}_2^4\text{He} \rightarrow {}_{94}^{239}\text{Pu} + 3{}_0^1\text{n}$