

## UNIT 6 - RADIOACTIVITY AND NUCLEAR CHEMISTRY

### HONORS HOMEWORK 6.1A

Use this template for nuclear symbols and equations:  ${}^a_bX \rightarrow {}^a_bX + {}^a_bX$

#### 1) Nuclear equations vs Chemical Equations

Briefly summarise the main differences between nuclear equations and chemical equations in the table below:

Nuclear equations	Chemical Equations
Involve changes in the composition of the nucleus, and so involve the formation of new atoms	Involve changes in electrons in shells only; no new atoms are formed
Always include atomic numbers and mass numbers	Generally do not include atomic numbers and mass numbers
Don't usually include charges	Must include charges

#### 2) Writing nuclear equations

(a)	Write a nuclear equation to show the emission of an alpha particle by radium-224	${}^{224}_{88}\text{Ra} \rightarrow {}^4_2\alpha + {}^{220}_{86}\text{Rn}$
(b)	Write a nuclear equation to show the emission of an alpha particle by americium-241	${}^{241}_{95}\text{Ra} \rightarrow {}^4_2\alpha + {}^{220}_{86}\text{Rn}$
(c)	Write a nuclear equation to show the emission of a beta particle by actinium-228	${}^{228}_{89}\text{Ac} \rightarrow {}^0_{-1}\beta + {}^{228}_{90}\text{Th}$
(d)	Write a nuclear equation to show the emission of a beta particle by oxygen-18	${}^{18}_8\text{O} \rightarrow {}^0_{-1}\beta + {}^{18}_9\text{F}$
(e)	Polonium-216 is formed when another atom releases an alpha particle. Write a nuclear equation for this reaction.	${}^{220}_{86}\text{Rn} \rightarrow {}^4_2\alpha + {}^{216}_{84}\text{Po}$
(f)	Nitrogen-14 is formed when another atom releases a beta particle. Write a nuclear equation for this reaction.	${}^{14}_6\text{C} \rightarrow {}^0_{-1}\beta + {}^{14}_7\text{N}$