

UNIT 6 - RADIOACTIVITY AND NUCLEAR CHEMISTRY

6.1 CLASS WORKSHEET

HOMEWORK 6.1A

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)	Complete the nuclear equation to show the emission of an alpha particle by radium-224	${}_{88}^{224}\text{Ra} \rightarrow {}_2^4\alpha + {}_{86}^{220}\text{Rn}$
(b)	Write a nuclear equation to show the emission of an alpha particle by americium-241	${}_{95}^{241}\text{Ra} \rightarrow {}_2^4\alpha + {}_{86}^{220}\text{Rn}$
(c)	Complete the nuclear equation to show the emission of a beta particle by actinium-228	${}_{89}^{228}\text{Ac} \rightarrow {}_{-1}^0\beta + {}_{90}^{228}\text{Th}$
(d)	Write a nuclear equation to show the emission of a beta particle by oxygen-18	${}_{8}^{18}\text{O} \rightarrow {}_{-1}^0\beta + {}_9^{18}\text{F}$
(e)	Polonium-216 is formed when another atom releases an alpha particle. Complete the nuclear equation for this reaction.	${}_{86}^{220}\text{Rn} \rightarrow {}_2^4\alpha + {}_{84}^{216}\text{Po}$
(f)	Nitrogen-14 is formed when another atom releases a beta particle. Write a nuclear equation for this reaction.	${}_{6}^{14}\text{C} \rightarrow {}_{-1}^0\beta + {}_7^{14}\text{N}$