

KEY

## Isotopes & Nuclear Reactions

Fill in all blanks.

	<u># Protons</u>	<u># Neutrons</u>	<u>Mass #</u>	<u>Atomic #</u>
1. ${}_{\text{Mn}}^{55}$	25	30	55	25
2. ${}_{\text{Cd}}^{113}$	48	65	113	48
3. ${}_{\text{U}}^{234}$	92	142	234	92
4. ${}_{\text{Cr}}^{52}$	24	28	52	24

$\alpha/\beta$  Decay

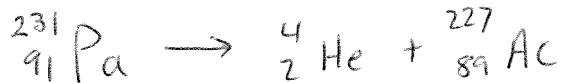
	<u>Decay type name</u>
5. ${}_{\text{U}}^{238} \rightarrow ({}_{\text{He}}^4) + {}_{\text{Th}}^{234}$	$\alpha$
6. $({}_{\text{Th}}^{234}) \rightarrow {}_{-1}^0 e + {}_{\text{Pa}}^{234}$	$\beta$
7. ${}_{\text{Ra}}^{226} \rightarrow {}_{\text{He}}^4 + ({}_{\text{Rn}}^{222})$	$\alpha$
8. $({}_{\text{Bi}}^{218}) \rightarrow {}_{-1}^0 e + {}_{\text{Po}}^{218}$	$\beta$
9. ${}_{\text{Th}}^{234} \rightarrow {}_{\text{He}}^4 + ({}_{\text{Ra}}^{220})$	$\alpha$

Fill in the missing information in this decay series.

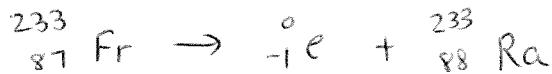
	<u>Name of type of decay</u>
10. ${}_{\text{U}}^{238} \rightarrow ({}_{\text{He}}^4) + {}_{\text{Th}}^{234}$	$\alpha$
11. $({}_{\text{Th}}^{234}) \rightarrow {}_{-1}^0 e + {}_{\text{Pa}}^{234}$	$\beta$
12. $({}_{\text{Pa}}^{234}) \rightarrow ({}_{-1}^0 e) + {}_{\text{U}}^{234}$	$\beta$
13. ${}_{\text{U}}^{234} \rightarrow {}_{\text{He}}^4 + ({}_{\text{Th}}^{230})$	$\alpha$
14. $({}_{\text{Th}}^{230}) \rightarrow ({}_{\text{He}}^4) + {}_{\text{Ra}}^{226}$	$\alpha$
15. ${}_{\text{Ra}}^{226} \rightarrow {}_{\text{He}}^4 + ({}_{\text{Rn}}^{222})$	$\alpha$
16. $({}_{\text{Rn}}^{222}) \rightarrow ({}_{\text{He}}^4) + {}_{\text{Po}}^{218}$	$\alpha$
17. ${}_{\text{Po}}^{218} \rightarrow {}_{-1}^0 e + ({}_{\text{At}}^{214})$	$\beta$

## Nuclear Reactions

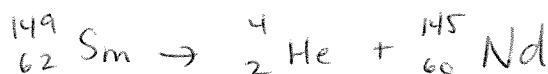
1. Write the nuclear reaction for the alpha decay of  $^{231}_{91}\text{Pa}$ .



2. Write the nuclear reaction for the beta decay of  $^{233}_{87}\text{Fr}$ .



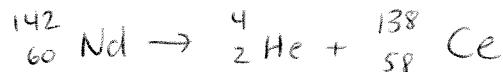
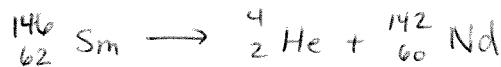
3. Write the nuclear reaction for the alpha decay of  $^{149}_{62}\text{Sm}$ .



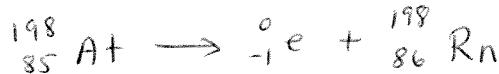
4. Write the nuclear reaction for the beta decay of  $^{165}_{61}\text{Pm}$ .



5. Write the nuclear reaction of  $^{146}_{62}\text{Sm}$  that undergoes 2 alpha decays.



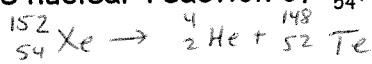
6. Write the nuclear reaction of  $^{198}_{85}\text{At}$  that undergoes 2 beta decays.



7. Write the nuclear reaction of  $^{150}_{64}\text{Gd}$  that undergoes 1 alpha and 2 beta decays.



8. Write the nuclear reaction of  $^{152}_{54}\text{Xe}$  that undergoes 2 alpha and 1 beta decay.



9. If  $^{120}_{55}\text{Cs}$  decays into  $^{108}_{47}\text{Ag}$ , then how many alpha decays has it undergone?

~~\*\*\*~~ **X WON'T WORK**

