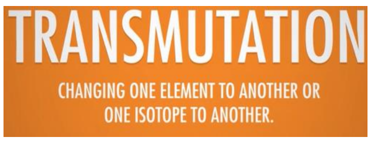
Name ____ Period __________

Crash Course in Chemistry #38

https://www.youtube.com/watch?v=KWAsz59F8gA

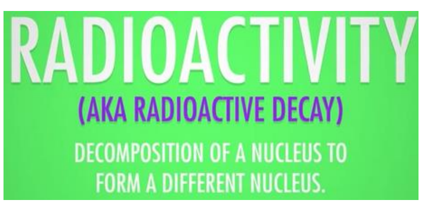
Welcome to the new age. Radioactivity is prominent in popular imagination and at the same time

completely misunderstood. Radioactivity is different than "normal" chemistry which is what happens when an atom's outermost ____________________ do stuff. When the protons and neutrons get directly involved and their numbers do change, huge amounts of energy can be released -- far more than by the transfer of electrons.

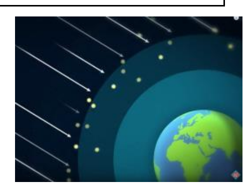
	When the protons change
	When the neutrons change

While it is so ridiculously expensive to use transmutation to produce gold from lead, the very fact that it is possible should clue you in that nuclear chemistry is an entirely different flavor of chemistry sauce.

When it comes down to it, the changes that take place in nuclear chemistry come from a desire for what we all want: _________________________________. Certain combinations of protons and neutrons make the nucleus more stable. Unstable nuclei will spontaneously release things to become stable. This is called radioactive decay. There are 3 types of decay -- Describe them below:

 	 Track the amount of P-32 (half-life = 14.3 days) left after 14.3d 28.6d 42.9d
	α decay 
	β decay
	γ decay

Why are there still radioactive elements around-Shouldn't they go away?



$$^{238}_{92}U \longrightarrow {}^{4}_{2}He^{2+} + {}^{234}_{90}Th \qquad {}^{234}_{90}Th \longrightarrow {}^{0}_{-1}e + {}^{234}_{91}Xe$$

$$^{238}_{92}U^{*} \longrightarrow {}^{4}_{2}He + 2\,{}^{0}_{0}\gamma + {}^{234}_{90}Th$$

Note the nuclear notation keeping track of nuclear particles! They add up on both sides of the arrow… If that U-238 is excited (*), α and γ radiation can be emitted at the same time.

Spontaneous fission is when an atom simply breaks into two smaller atoms:

$$^{254}_{98}Cf \longrightarrow {}^{140}_{54}Xe + {}^{108}_{44}Ru + 4\,n^{0}$$

Questions raised by this video you would like answered:

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NUCLEAR CHEMISTRY

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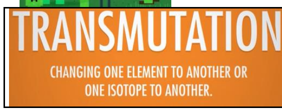
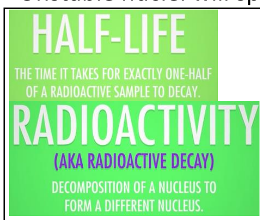


	When the protons change
	When the neutrons change

Unstable nuclei will spontaneously decay to become stable. There are 3 types of decay -- Describe them below:



PHOSPHORUS-32	Track the amount of P-32 (half-life = 14.3 days) left after 14.3d 28.6d 42.9d
α decay	
β decay	
γ decay	

$^{238}_{92}U \rightarrow {}^{4}_{2}He^{2+} + {}^{234}_{90}Th$ $\quad$ $^{234}_{90}Th \rightarrow {}^{0}_{-1}e + {}^{234}_{91}Xe$

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Crash Course 38

Name ____________________________________ Per ____________

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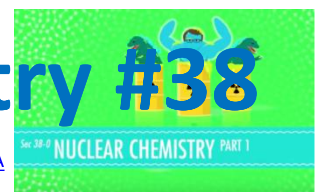

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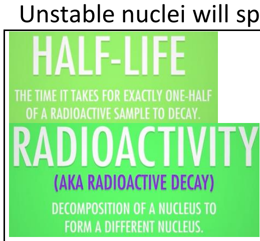

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