Unit
13
Lesson
2

AIM
- Nuclear Decay Modes Practice

AGENDA
- U13L2 Lesson video
- Decay Mode Practice
- The Uranium Challenge

YOYO
- Watch the lesson video on YouTube (U13L2)

HOMEWORK
- CL#26 – Nuclear Decay – Due TONIGHT by 11:59 pm
- Follow calendar

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Writing Nuclear Equations

Use Table N and O! When elements undergo radioactive decay, they change from one element to another. This happens by losing high energy alpha or beta particles, or by emitting positrons. The process of an atom becoming a different atom is called **transmutation**. Nuclear equations are written to track the changes that occur during transmutation. When writing nuclear equations, it is important to make sure that *mass and charge are conserved*. Write the complete nuclear equation for the spontaneous decay of the following nuclides

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Writing Nuclear Equations
Question 1:

^{37}Ca Decay Mode: _____

Equation: _____

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Writing Nuclear Equations
Question 2:

Iron-53 Decay Mode: _____

Equation: _____

4

Writing Nuclear Equations
Question 3:

Neon-19 Decay Mode: _____

Equation: _____

5

Writing Nuclear Equations
Question 4:

^{42}K Decay Mode: _____

Equation: _____

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Writing Nuclear Equations
Question 5:

Iodine-131 Decay Mode: _____

Equation: _____

7

Writing Nuclear Equations
Question 6:

Strontium-90 Decay Mode: _____

Equation: _____

8

Writing Nuclear Equations
Question 7:

Radon-222 Decay Mode: _____

Equation: _____

9

Writing Nuclear Equations
Question 8:

^{220}Fr Decay Mode: _____

Equation: _____

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Writing Nuclear Equations
Question 9:

Thorium-232 Decay Mode: _____

Equation: _____

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Writing Nuclear Equations
Question 10:

^{198}Au Decay Mode: _____

Equation: _____

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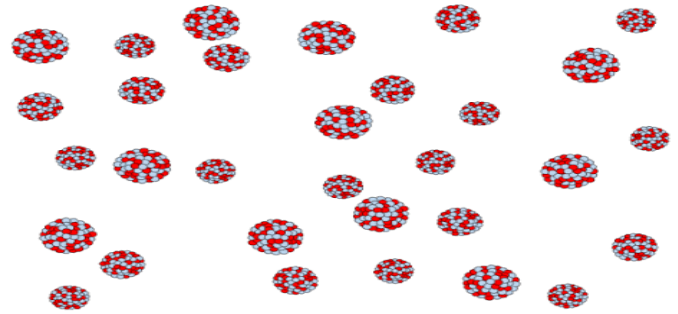
The Uranium Challenge



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The Uranium Challenge

Directions: Observe the first few steps of the Uranium decay process. Uranium needs 14 separate decay processes in order to reach a stable nucleus. Fill in the remaining decay equations.

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The Uranium Challenge

Step	Decay Mode	Parent Nuclide → Daughter Nuclide
1	α	$^{238}_{92}U \rightarrow {}^{4}_{2}He + {}^{234}_{90}Th$
2	β^-	$^{234}_{90}Th \rightarrow {}^{0}_{-1}e + {}^{234}_{91}Pa$
3	β^-	$^{234}_{91}Pa \rightarrow {}^{0}_{-1}e + {}^{234}_{92}U$
4	α	$^{234}_{92}U \rightarrow {}^{4}_{2}He + {}^{230}_{90}Th$

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The Uranium Challenge

Step	Decay Mode	Parent Nuclide → Daughter Nuclide
4	α	$^{234}_{92}U \rightarrow {}^{4}_{2}He + {}^{230}_{90}Th$
5	α	
6	α	
7	α	

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The Uranium Challenge

Step	Decay Mode	Parent Nuclide	→	Daughter Nuclide
7	α			
8	α			
9	β^-			
10	β^-			

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The Uranium Challenge

Step	Decay Mode	Parent Nuclide	→	Daughter Nuclide
10	β^-			
11	α			
12	β^-			
13	β^-			

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The Uranium Challenge

Step	Decay Mode	Parent Nuclide	→	Daughter Nuclide
13	β^-			
14	α			

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The Uranium Challenge

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