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1. 020 Chapter #039

A pure sample of tritium, ^3H , was prepared and sealed in a container for a number of years. Tritium undergoes β decay with a half-life of 12.32 years. How long has the container been sealed if analysis of the contents shows there are 5.25 mol of ^3H and 6.35 mol of ^3He present?

Student Response	Value	Correct Answer	Feedback
a. 2.34 y			
b. 3.38 y			
c. 9.77 y			
d. 14.1 y			
e. 25.6 y			

2. 020 Chapter #059

Which one of the following elements is formed largely in supernova explosions?

Student Response	Value	Correct Answer	Feedback
a. H			
b. He			
c. Mg			
d. Fe			
e. U			

3. 019 Chapter #076

Two cells are connected in series, so that the same current flows through two electrodes where the following half-reactions occur $\text{Cu}^{2+}(\text{aq}) + 2\text{e}^- \rightarrow \text{Cu}(\text{s})$ and $\text{Ag}^+(\text{aq}) + \text{e}^- \rightarrow \text{Ag}(\text{s})$. For every 1.00 g of copper produced in the first process, how many grams of silver will be produced in the second one?

Student	Value	Correct	Feedback
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Response	Answer
a. 0.294 g	
b. 0.588 g	
c. 0.850 g	
d. 1.70 g	
e. 3.40 g	

4. **019 Chapter #018**

What is the name given to the apparatus that connects the two solutions by a conducting medium through where the cations and anions can move from one half-cell to the other?

Student Response	Value	Correct Answer	Feedback
a. cathode			
b. electrode			
c. galvanic cell			
d. salt bridge			
e. fuel cell			

Score: 5/5

5. **019 Chapter #066**

What product forms at the anode during the electrolysis of molten NaBr?

Student Response	Value	Correct Answer	Feedback
a. Na ⁺ (l)			
b. Na(l)			
c. Br ⁻ (l)			
d. Br ₃ ⁻ (l)			
e. Br ₂ (g)			

Score: 5/5

6. 020 Chapter #002

Beta particles are identical to:

Student Response	Value	Correct Answer	Feedback
a. protons.			
b. helium atoms.			
c. hydrogen atoms.			
d. helium nuclei.			
e. electrons.			

Score: 5/5

7. 019 Chapter #051

Which one of the following statements relating to the glass electrode is correct?

Student Response	Value	Correct Answer	Feedback
a. The glass electrode detects hydrogen gas.			
b. The glass of a glass electrode serves to conduct electrons.			
c. When pH is measured, only a single electrode, the glass			

electrode, need be used.
d. The potential of the glass electrode varies linearly with the pH of the solution.
e. None of these statements is correct.

Score: 5/5

8. 020 Chapter #079

Naturally occurring uranium contains approximately 1% U-235 and 99% U-238. Of these, the isotope that undergoes fission in a nuclear reactor is U-238.

Student Response	Value	Correct Answer	Feedback
a. TRUE			
b. FALSE			

Score: 5/5

9. 020 Chapter #009

What particle or type of radiation needs to be included to balance this equation?
 $^{208}\text{Pb} \rightarrow ? + ^{204}\text{Hg}$

Student Response	Value	Correct Answer	Feedback
a. gamma			
b. alpha			

c. proton
d. beta
e. positron

Score: 5/5

10. 019 Chapter #034

Consider the following standard reduction potentials in acid solution:

	$E^\circ(\text{V})$
$\text{Al}^{3+} + 3\text{e}^- \rightarrow \text{Al}(\text{s})$	-1.66
$\text{AgBr}(\text{s}) + \text{e}^- \rightarrow \text{Ag}(\text{s}) + \text{Br}^-$	+0.07
$\text{Sn}^{4+} + 2\text{e}^- \rightarrow \text{Sn}^{2+}$	+0.14
$\text{Fe}^{3+} + \text{e}^- \rightarrow \text{Fe}^{2+}$	+0.77

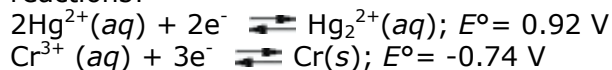
The strongest oxidizing agent among those shown above is:

	Student Response	Value	Correct Answer	Feedback
a. Fe^{3+}				
b. Fe^{2+}				
c. Br^-				
d. Al^{3+}				
e. Al.				

Score: 5/5

11. 019 Chapter #027

What is the E°_{cell} for the cell represented by the combination of the following half-reactions?



	Student Response	Value	Correct Answer	Feedback
a. -0.18 V				
b. 0.18 V				
c. 1.28 V				

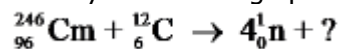
d. 1.66 V

e. 2.12 V

Score: 5/5

12. 020 Chapter #049

Identify the missing species in the following nuclear transmutation.

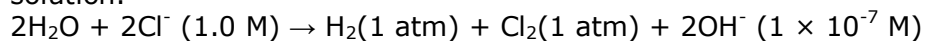


	Student Response	Value	Correct Answer	Feedback
a.	${}_{102}^{254}\text{No}$			
b.	${}_{102}^{258}\text{No}$			
c.	${}_{98}^{238}\text{Cf}$			
d.	${}_{90}^{238}\text{Th}$			
e.	None of these choices is correct.			

Score: 5/5

13. 019 Chapter #062

Calculate the minimum voltage required for the electrolysis of 1.0 M NaCl in neutral solution.



	Student Response	Value	Correct Answer	Feedback
a.	2.19 V			
b.	1.78 V			
c.	0.41 V			
d.	-0.41 V			

e. -1.78 V

Score: 5/5

14. 019 Chapter #043

Which equation is correct?

Student Response
a. $E^{\circ}_{\text{cell}} = E^{\circ}_{\text{anode}} - E^{\circ}_{\text{cathode}}$
b. $E^{\circ}_{\text{cell}} = E^{\circ}_{\text{cathode}} + E^{\circ}_{\text{anode}}$
c. $E^{\circ}_{\text{cell}} = E^{\circ}_{\text{cathode}} - E^{\circ}_{\text{anode}}$
d. $E^{\circ}_{\text{cell}} = E^{\circ}_{\text{cathode}}/E^{\circ}_{\text{anode}}$

15. 020 Chapter #021

1 joule equals:

Student Response
a. 1 kg m
b. 1 g m ² s ²
c. 1 kg m ² /s
d. 1 g m ² /s
e. 1 kg m ² /s ²

16. 019 Chapter #002

Complete and balance the following redox equation using the smallest whole-number coefficients. What is the coefficient of Sn in the balanced equation?
 $\text{Sn} + \text{HNO}_3 \rightarrow \text{SnO}_2 + \text{NO}_2 + \text{H}_2\text{O}$ (acidic solution)

Student Response

a. 1
b. 2
c. 3
d. 4
e. 5

17. 020 Chapter #014

Select the nuclide that completes the following nuclear reaction ${}_{23}^{50}\text{V} + {}_{-1}^0\text{e} \rightarrow$ _____.

	Student Response
a.	${}_{22}^{50}\text{Ti}$
b.	${}_{24}^{50}\text{Cr}$
c.	${}_{23}^{51}\text{V}$
d.	${}_{23}^{49}\text{V}$
e.	None of these choices is correct.

Score: 5/5

18. 020 Chapter #069

What causes the radiation damage to matter when gamma-rays damage it?

	Student Response
a.	another isotope
b.	oxidation
c.	reduction
d.	free radicals and ions
e.	corrosion

Score: 0/5

19. 019 Chapter #012

Consider the following balanced redox reaction
 $3\text{CuO}(s) + 2\text{NH}_3(aq) \rightarrow \text{N}_2(g) + 3\text{H}_2\text{O}(l) + 3\text{Cu}(s)$.
Which of the following statements is true?

Student Response
a. $\text{CuO}(s)$ is the oxidizing agent and copper is reduced.
b. $\text{CuO}(s)$ is the oxidizing agent and copper is oxidized.
c. $\text{CuO}(s)$ is the reducing agent and copper is oxidized.
d. $\text{CuO}(s)$ is the reducing agent and copper is reduced.
e. $\text{CuO}(s)$ is the oxidizing agent and $\text{N}_2(g)$ is the reducing agent.

Score: 5/5

20. 020 Chapter #029

Iodine-131, $t_{1/2} = 8.0$ days, is used in diagnosis and treatment of thyroid gland diseases. If a laboratory sample of iodine-131 initially emits 9.95×10^{18} β particles per day, how long will it take for the activity to drop to 6.22×10^{17} β particles per day?

Student Response
a. 2.0 days
b. 16 days
c. 32 days
d. 128 days
e. None of these choices is correct.

Score: 5/5