

CP Chemistry of the Earth

Assignment 1S – Unit 1 Review

30 Points

Answer the following questions based on the in class notes

Mass#
Atomic #
element
Mass#

Isotope A - X	Atomic #	Mass #	Protons (p ⁺)	Electrons (e ⁻)	Neutrons (n ⁰)	(Mass# amu) Atomic Mass (amu) Not on PT
⁵¹ ₂₃ V	23	51	23	23	51-23 28	51 amu
Zinc-65	Atomic# = P ⁺ = e ⁻ Mass# = P ⁺ + n ⁰ n ⁰ = Mass# - Atomic#					
	74	184				
Tin - ¹¹⁹	50	50+69 119	50	50	69	119 amu

Complete the following Chart to find the average atomic mass — = round (2 after)

* 72.0% → 0.720

Cobalt has the following isotopes

Isotope	Atomic Mass (amu)	Fractional Abundance
Co- <u>57</u>	57 amu	0.052
Co- <u>58</u>	58 amu	0.182
Co- <u>59</u>	59 amu	0.720*
Co- <u>61</u>	61 amu	0.046

Isotope	Atomic Mass (amu)	Fractional Abundance	Ratio (amu)
Co-57	57 amu	× 0.052 =	2.96 amu
Co-58	58 amu	× 0.182 =	10.56 amu
Co-59	59 amu	× 0.720 =	42.48 amu
Co-61	61 amu	× 0.046 =	2.81 amu

Calculate the Average Atomic Mass of Co

Avg Atomic Mass = 2.96 amu + 10.56 amu + 42.48 amu + 2.81 amu = 58.81 amu

Complete the following nuclear decay equations 225-4=221

²²⁵ ₈₉ Ac	→	⁴ ₂ He	+	²²¹ ₈₇ Fr	→	⁴ ₂ He	+	²⁴⁷ ₉₆ Cm
¹⁸⁸ ₇₄ W	→	⁰ ₋₁ e ⁻	+	¹⁸⁸ ₇₅ Re	→	⁰ ₋₁ e ⁻	+	⁴⁵ ₂₁ Sc
³⁸ ₁₈ Ar	→	⁰ ₊₁ e ⁺	+	⁹⁹ ₄₃ Tc	→	⁰ ₊₁ e ⁺	+	⁹⁹ ₄₂ Mo

89-2=87
188-0=188
74-(-1)=75
0+99+1+42

Complete the following nuclear decay chain

Cesium-135 Decay Chain

Decay 1 (α decay)

135	Cs	\rightarrow	0	e^-	+		
55			-1				

Decay 2 (β^- decay)

		\rightarrow	4	He	+		
			2				

Decay 3 (β^- decay)

		\rightarrow	0	e^-	+		
			-1				

Decay 4 (α decay)

		\rightarrow	0	e^-	+		
			-1				

Complete the following charts based on the half-life of nuclear particles

Isotope	Starting Particles (N^o)	Number HL passed (n)	Remaining Particles (N_t)	Number HL passed (n)	Remaining Particles (N_t)
^{10}Be	100000	4	6250	8	391

Isotope	Starting Particles (N^o)	HL Time	Total Time	# HL Passed	Remaining Particles (N_t)
^{33}P	100000	15.6days	93.6days	6	1563

Complete the section below with additional notes from the in class presentation for the extra credit bonus points on the Unit 1 Test (Cheat Sheet)

★ Starting Amount
 $\rightarrow 2^n$
 Start $\div 2$ $\boxed{y^x}$ n

$n = \# \text{ HL}$
 $\div 2$ "n times"

$$\# \text{ HL} = \frac{\text{Total time}}{\text{HL time}}$$