

UNIT 2 – ATOMIC STRUCTURE

IPOD Questions



IT'S *THE* PROBLEM OF *THE* DAY

IPOD # 6

Complete the following chart:

<u>Name</u>	<u>Symbol</u>	<u>Shorthand Notation</u>	<u>Atomic Notation</u>	<u>Atomic #</u>	<u>Mass #</u>	<u>Protons</u>	<u>Neutrons</u>	<u>Electrons</u>
			${}_{29}^{63}\text{Cu}$					
				80				
							24	21
		Bromine-80						

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IPOD # 7

If element X consists of 78.7% of atoms with a mass of 24.0 amu, 10.1% of atoms with a mass of 25.0 amu, and 11.2% of atoms with a mass of 26.0 amu, what is the average atomic mass of element X?



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IPOD # 8


Write the balanced nuclear equations for the following decay processes:

- a) Alpha radiation is emitted when the isotope Radon-222 decays.
- b) The radioisotope Potassium-40 is a beta emitter.
- c) Gamma radiation is emitted when the isotope Phosphorus-32 decays.



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IPOD # 9

- a) A patient is given 20 mg of iodine-131. The half life of iodine-131 is 8 days. How much of the isotope will remain in the patient's body after 40 days.
 - b) Why is it important that radioactive isotopes used for diagnosis or treatment of medical problems have relatively short half-lives?
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IPOD # 10

Write electron configurations & orbital notation for the following elements:

a) P

b) Ni

c) Ce



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IPOD # 11

Write electron configurations or orbital notation for the following elements:

a) Longhand – Ag

b) Shorthand – Pb

c) Orbital – Mn



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IPOD # 12

- a) Sodium vapor lamps are used to illuminate streets and highways. One of the visible lines on the emission spectra has a frequency of 5.09×10^{14} Hz. What is the wavelength?

- b) Calculate the energy of a photon of blue light with a wavelength of 460 nm.



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IPOD # 13

Complete the following chart:

<u>Element</u>	<u>Family Name</u>	<u>Shorthand Configuration</u>	<u>Valence Electrons</u>	<u>Lewis Dot Structure</u>	<u>Lose or Gain electrons?</u>	<u>Cation or anion?</u>	<u>Ion Symbol</u>
Fluorine							
Neon							
Calcium							

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IPOD # 14

Apply trends of the periodic table to the following:

- a) Which element has the larger atomic radius, Carbon or Lead?
- b) Which element has the greater first ionization energy, Strontium or Iodine?
- c) Which particle has the larger radius, Fe or Fe³⁺?
- d) Which element has the lower electronegativity, Phosphorus or Sodium?
- e) Arrange the following in order of increasing ionization energy: Silver, Iodine, Zirconium, Strontium.

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IPOD # 15

- a) Pumice is volcanic rock that contains many trapped air bubbles. A 225-gram sample occupied 236.6 mL. What is the density of pumice? Will pumice float on water?
The density of water is 1.0 g/mL
- b) A 20.0 g sample of metal pellets is poured into a graduated cylinder containing 15.6 mL of water, causing the water level to rise to 21.9 mL. Calculate the density of the metal pellets.



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IPOD # 16

For each description below, list an ELEMENT that fits the description:

- a) Alkali element in period 5.
- b) -2 ion from period 3.
- c) Metal from group 4A.
- d) Metalloid from Group 4A.
- e) Period 2 element with 2 valence electrons.
- f) Halogen that is a liquid at room temperature.

