

AP Chemistry – Having Fun Yet??? – 6

Name _____ Per ____

1. The density of Titanium is 4.51 g/cm^3 at 25°C . What mass of Titanium displaces 65.8 mL of water at 25°C ?
2. A cylindrical rod formed from Silicon is 16.8 cm long and has a mass of 2.17 kg. The density of Silicon is 2.33 g/cm^3 . What is the diameter of the cylinder?
3. Neon has a melting point of -248.6°C and a boiling point of -246.1°C . What are these temperatures in Kelvins? (Use $0^\text{K} = -273.15^\circ\text{C}$ and report your answers using proper significant figures.)
4. An individual with high cholesterol has 232 mg of cholesterol per $\bar{100}$ mL of blood. If the total blood volume of the individual is 5.2 L, how many grams of total blood cholesterol does the person have?
5. In the decomposition of Dihydrogen Sulfide, the elements Hydrogen and Sulfur are produced. If 6.500 g of Dihydrogen Sulfide is completely decomposed and 0.384 g of Hydrogen is obtained, how much Sulfur must be obtained?
6. An atom of Rhodium has a diameter of about 2.5×10^{-8} cm. What is the radius of a Rhodium atom in Angstroms and in meters?

7. Only two isotopes of Copper occur naturally, ^{63}Cu (mass = 62.9296 amu; abundance 69.17%) and ^{65}Cu (mass = 64.9278 amu; abundance 30.83%). What is the average atomic mass of Copper?

8. How many (a) oxygen atoms are represented in the chemical formula $\text{Ca}(\text{ClO}_3)_2$ and (b) hydrogen atoms in $(\text{NH}_4)_2\text{HPO}_4$?

9. An Argon ion laser emits light at 489 nm. What is the (a) color of this light (b) frequency of this radiation and (c) the energy of each photon?

10. It requires a photon with a minimum energy of 4.41×10^{-19} J to emit electrons from Sodium metal. (a) What is the minimum frequency of light necessary to emit electrons from Sodium via the photoelectric effect? (b) What is the wavelength of this light?

11. What is the (a) energy, (b) frequency (c) wavelength (in nm) and (d) region of the electromagnetic spectrum of radiation emitted by a Hydrogen atom when an electron at $n = 5$ drops to $n = 1$?

12. What is the chemical formula for each substance mentioned?

a) Sodium hydrogen carbonate is used as a deodorant. _____

b) Calcium hypochlorite is used in some bleaching solutions. _____

c) Hydrogen cyanide is a very poisonous gas. _____

d) Magnesium hydroxide is used as a cathartic. _____

e) Tin(II) fluoride has been used as a fluoride additive in toothpaste. _____

f) When cadmium(II) sulfide is treated with sulfuric acid, fumes of dihydrogen monosulfide are given off.

13. Fill in the table below for the following ions:

Symbol	Protons	Mass Number	Charge	Electrons	Neutrons
Pu		244		91	
V			+1		27
Ga				29	38
Cl		37	-1		
Ni		58	+3		

14. What is the ℓ quantum number for a g orbital? _____

15. For a principle quantum number, n, equal to 6, what is largest allowed value of ℓ ? _____

16. For a principle quantum number, n, equal to 4, what is the total number of orbitals permitted? _____

17. For the quantum number, ℓ , equal to 6, how many orbitals of that type are permitted? _____

18. For a principle quantum number, n, equal to 8, what is the total electron capacity of that level? _____

19. What is the correct representation for an orbital which has an n value of 6 and an ℓ value of 2? _____

20. Draw the orbital notation for the atom of calcium. What are the four quantum numbers of the last electron in the orbital notation?