

## Chemistry Assignment

### Module 1.1

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### Notice of ADA Accommodation

I have an ADA accommodation to do my assignment on paper rather than the online system. This document is a utilization of that accommodation. I am having a hard time writing with a pen due to pain, so I am typing and dictating a  $\LaTeX$  document. I will need to speak to Dr. Moulder more in depth about this accommodation this week as it is seeming to be necessary.

### Homework Questions

1.  $\text{Al}^{2+} + \text{C}_2\text{H}_3\text{O}_2 \longrightarrow \text{Al}(\text{C}_2\text{H}_3\text{O}_2)_3$
2.  $\text{Hg}_2^{2+} + \text{CO}_3^{2-} \longrightarrow \text{Hg}_2\text{CO}_3$
3.  $\text{Al} + \text{O} \longrightarrow \text{Al}_2\text{O}_3$
4.  $\text{Ca} + \text{Br} \longrightarrow \text{CaBr}_2$
5.  $\text{K} + \text{Br} \longrightarrow \text{KBr}$
6.  $\text{Sr} + \text{Cl} \longrightarrow \text{SrCl}_2$
7.  $\text{Ca}^{2+} + \text{ClO}^- \longrightarrow \text{Ca}(\text{ClO})_2$
8.  $\text{Ca}^{2+} + \text{PO}_4^{3-} \longrightarrow \text{Ca}_3(\text{PO}_4)_2$
9. Chromium(II) Nitrite  $\longrightarrow \text{Cr}_3\text{N}_2$
10. Titanium(IV) Chloride  $\longrightarrow \text{TiCl}_4$
11. Calcium Oxide:  $\text{Ca}^{2+} + \text{O}^{2-} \longrightarrow \text{CaO}$
12. Ferrous Fe(II) and Ferric Fe(III) ions differ by the number of electrons they share (2 vs 3).
13. Barium Oxide BaO is the correct name-formula combo.
14. Copper(I) Sulfide CuS is incorrect. The correct formula is  $\text{Cu}_2\text{S}$ .
15.  $\text{Fe}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$  is called Iron(III) Nitrate Hexahydrate
16.  $\text{ClF}_3$  is called Chlorine trifluoride
17.  $\text{S}_2\text{F}_8$  is called disulfur octafluoride.

18. Cobalt(II) fluoride tetrahydrate is written  $\text{CoF}_2 \cdot 4 \text{H}_2\text{O}$ .
19. Diphosphorus pentabromide is written  $\text{P}_2\text{Br}_5$ .
20. Sulfur tetraiodide is written  $\text{SI}_4$ .
21. Balance  $\text{C}_3\text{H}_6(\text{g}) + \text{O}_2(\text{g}) \longrightarrow \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$ .
  - $2 \text{C}_3\text{H}_6(\text{g}) + 9 \text{O}_2(\text{g}) \longrightarrow 6 \text{CO}_2(\text{g}) + 6 \text{H}_2\text{O}(\text{g})$
22. Balance  $\text{PbCO}_3(\text{s}) \longrightarrow \text{PbO}(\text{s}) + \text{CO}_2(\text{g})$ .
  - $\text{PbCO}_3(\text{s}) \longrightarrow \text{PbO}(\text{s}) + \text{CO}_2(\text{g})$  is balanced.
23. A bar of soap is an example of a mixture.
24. An iron nail is an example of a mixture. It is likely a mixture of Iron(III) Oxide, elemental iron, and some other elemental metals (making in an alloy of sorts).
25. Pure water is an example of a compound.
26. Tearing a piece of paper is an example of a physical change.
27. Temperature is considered an intensive property. However I have questions (see email sent on 28 Jan 2024).
28. A chemical change occurs when a diamond is heated to 1100 K in an air atmosphere and forms CO and  $\text{CO}_2$ .
29. A chemical property of Neon is that it is inert.
30. The law of multiple proportions explains the constant ration of carbon te hydregon in acetylene gas.
31. The cathode ray tube experiment determined the existence of electrons.
32.  $^{20}\text{Ne}$  and  $^{22}\text{Ne}$  are both isotopes of Neon.
33. Protons and Neutrons are found in the nuclei of atoms.
34. There are 143 neutrons in an atem of  $^{235}\text{U}$ .
35. There are 38 protons in an atom of  $^{90}\text{Sr}$
36.  $^{100}\text{Ru}$  has 56 neutrons.
37.  $^{60}\text{Ni}$  contains 28 protons and 32 neutrons.
38.  $^{133}\text{Cs}$  contains 55 protons, 78 neutrons, and 55 electrons.4
39. The average atomic mass of element X with isotopes  $^{25}\text{X}$  (80.50%, 25.03 amu), and  $^{27}\text{X}$  (19.50%, 26.98 amu) is 25.41 amu.
40.  $\text{SiF}_4$  contains the metalloid Silicon.
41. Cu is the elemental symbol for copper.
42. Lead has the atomic symbol Pb.

- 43. Germanium is the third period of group 4A.
- 44. Sulfur is chemically similar to Selenium.
- 45. Beryllium is an alkaline earth metal.
- 46. Helium is a noble gas.
- 47. Lithium Chloride ( $\text{LiCl}$ ) contains a metal.
- 48. Sodium does not have the chemical symbol S. It has the chemical symbol Na.