**Unit I      Safety Unit Analysis Measurement**

**Lesson            Day                 Date                Topic                                                   Homework**

[1.](http://iannonechem.com/Sc/notes/unit1/1.safetypresentation.ppt)                                                         Safety                                                             1

[2.](http://iannonechem.com/Sc/notes/unit1/1.safetypresentation.ppt)                                                         Disssociation and Ionic Formulas                   [2](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#a1)

[3.](http://iannonechem.com/Sc/notes/unit1/2ionicformuladissociation.ppt)                                                         Balancing and Word Equations                       [3](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#b2)

[4.](http://iannonechem.com/Sc/notes/unit1/4.physicalchemicalchange.ppt)                                                         Physical and Chemical Changes                      [4](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#b3)

[5.](http://iannonechem.com/Sc/notes/unit1/5.matterandbonding.ppt)                                                         Matter and Bonding                                         [5](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#b4)

[6.](http://iannonechem.com/Sc/notes/unit1/5.uncertaintyprelab.ppt)                                                         Review and Lab Preparation                           [6](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#b5)

[7.](http://iannonechem.com/Sc/notes/unit1/5.uncertaintyprelab.ppt)                                                         Uncertainty Lab Day 1                                     [Lab Handout](http://iannonechem.com/Sc/notes/unit1/Lab%20-%20Uncertainty.pdf)

[8.](http://iannonechem.com/Sc/notes/unit1/6.micrometervernier.ppt)                                                         Uncertainty Lab Day 2

[9.](http://iannonechem.com/Sc/notes/unit1/8.uncertaintyandsignificant.ppt)                                                         Measurement and Uncertainty                          [7](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#b6)

[10.](http://iannonechem.com/Sc/notes/unit1/9.significantfigures.ppt)                                                       Significant Figures                                           [8](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#b7)

[11.](http://iannonechem.com/Sc/notes/unit1/10.unitanalysismetric.ppt)                                                       Unit Analysis 1                                                [9](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#b8)

[12.](http://iannonechem.com/Sc/notes/unit1/11.unitanalysisnonmetric.ppt)                                                       Unit Analysis 2                                                [10](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#b9)

[13.](http://iannonechem.com/Sc/notes/unit1/12.readingscales.ppt)                                                       Reading Scales                                                [11](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#b10)

[14.](http://iannonechem.com/Sc/notes/unit1/13.densitycalculations.ppt)                                                       Density Calculations                                       [12](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#a12)

[15.](http://iannonechem.com/Sc/notes/unit2/12.derivedunits.ppt)                                                       Practice Test                                                   [13](http://iannonechem.com/Sc/workbookanswers/2.answers.htm#b11)

16.                                                       Test

**Assignment # 1           Safety**

**Complete the safety map for the room by indicating the location of the three fire extinguishers, five doors, eyewash, fume-hood, fire blanket, aprons, eye-goggles, broken glass container, spill control pillows, four soap dispensers, three paper towel dispensers, and the soap sprayer. This is like a treasure hunt. Get up and look for everything.**

**Assignment # 2**     **Ionic Formulas**

Write the **ionic formula**, **name**, and **dissociation equation** for each combination indicated by the cell below.

Note that **all ionic compounds** (start with metals) are **solids** at room temperature.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Li | Mg | Al | NH4 | Na |
| OH | 1 | 2 | 3 | 4 | 5 |
| SO4 | 6 | 7 | 8 | 9 | 10 |
| Br | 11 | 12 | 13 | 14 | 15 |
| F | 16 | 17 | 18 | 19 | 20 |
| NO3 | 21 | 22 | 23 | 24 | 25 |
| PO4 | 26 | 27 | 28 | 29 | 30 |
| S | 31 | 32 | 33 | 34 | 35 |
| C2O4 | 36 | 37 | 38 | 39 | 40 |

**1.         LiOH              Lithium hydroxide**                **LiOH(s)**  **→     Li+(aq)   +     OH-(aq)**

**2.**

**3.         Al(OH)3Aluminum hydroxide  Al(OH)3(s)    →   Al3+(aq)    +    3OH-(aq)**

**4.**

**5.         NaOH             Sodium hydroxide                  NaOH(s)   →   Na+(aq)    +    OH-(aq)**

**6.**

**7.         MgSO4            Magnesium sulphate              MgSO4(s)   →   Mg2+(aq)    +    SO42-(aq)**

**8.**

**9.         (NH4)2SO4      Ammonium sulphate              (NH4)2SO4(s) →    2NH4+(aq)   +      SO42-(aq)**

**10.**

**11.       LiBr                Lithium bromide                    LiBr(s)     →   Li+(aq)    +    Br-(aq)**

**12.**

**13.      AlBr3               Aluminum bromide                 AlBr3(s)       →   Al3+(aq)    +    3Br-(aq)**

**14.**

**15.       NaBr               Sodium bromide                     NaBr(s)   →   Na+(aq)    +    Br-(aq)**

**16.**

**17.       MgF2               Magnesium Fluoride              MgF2(s)   →     Mg2+(aq)   +   2F-(aq)**

**18.**

**19.       NH4F            Ammonium Fluoride                NH4F(s)   →   NH4+(aq)    +    F-(aq)**

**20.**

**21.       LiNO3             Lithium nitrate                         LiNO3(s)→   Li+(aq)    +   NO3-(aq)**

**22.**

**23.       Al(NO3)3         Aluminum nitrate                   Al(NO3)3(s)→   Al3+(aq)    +    3NO3-(aq)**

**24.**

**25.       NaNO3            Sodium nitrate                       NaNO3(s)   →   Na+(aq)    +    NO3-(aq)**

**26.**

**28.**      **AlPO4             Aluminum phosphate AlPO4(s)→   Al3+(aq)    +    PO43-(aq)**

**29.**

**30.**        **Na3PO4           Sodium phosphate                  Na3PO4(s)→   3Na+(aq)    +    PO43-(aq)**

**31.**

**32.**       **MgS                Magnesium sulphide              MgS(s)    →   Mg2+(aq)    +    S2-(aq)**

**33.**

**34.**      **(NH4)2S          Ammonium sulphide               (NH4)2S(s)    →   2NH4+(aq)    +    S2-(aq)**

**35.**

**36.**

**37.       MgC2O4        Magnesium oxalate         MgC2O4(s)   →   Mg2+(aq)    +    C2O42-(aq)**

**38.**

**39.       (NH4)2C2O4  Ammonium oxalate         (NH4)2C2O4(s)→  2NH4+(aq)   +  C2O42-(aq)**

 **Assignment #3** **Chemical Equations from Word Equation**

1.         Aqueous potassium hydroxide is reacted with aqueous sulphuric acid producing a solution of potassium sulphate and water.

**2KOH(aq)     +     H2SO4(aq)    →     K2SO4(aq)    +     2H2O(l)**

2.         Sodium metal is reacted with zinc iodide in solution.  The products obtained are aqueous sodium iodide in and zinc metal.

3.         Solid calcium sulphate dihydrate is added to gaseous sulphur trioxide producing solid calcium sulphate and aqueous sulphuric acid.

**CaSO4.2H2O(s)     +     2SO3(g)    →     CaSO4(s)    +     2H2SO4(aq)**

4.         Solid calcium phosphate and aqueous sodium nitrate are formed when solutions of sodium phosphate and calcium nitrate are mixed.

**2Na3PO4(aq)   +        3Ca(NO3)2(aq)                     Ca3(PO4)2(s)    +   6NaNO3(aq)**

5.         Sodium phosphite reacts with calcium nitrate in solution to produce two new ionic compounds. The calcium compound is solid while the other is aqueous.

**2Na3PO4(aq)   +        3Ca(NO3)2(aq)                     Ca3(PO4)2(s)    +   6NaNO3(aq)**

6.         Gaseous sulphur trioxide, a pollutant released into the atmosphere by burning coal reacts with liquid water in the air to make a solution of sulphuric acid (acid rain).

**SO3(g)   +    H20(l)         H2SO4(aq)**

**Assignment # 4            Physical and Chemical Changes Balancing Equations**

**Classify as a physical or chemical change.**

1.         Spoiling of food                                              **Chemical**

2.         Vaporization of ice                                          **Physical**

3.         Stretching of a rubber band                             **Physical**

4.         Dynamite explosion                                         **Chemical**

5.         Shattering of glass                                           **Physical**

6.         Decaying of dead bodies                                 **Chemical**

7.         Extraction of iron from form (Fe2O3)              **Chemical**

8.         Spontaneous combustion of oily rags              **Chemical**

9.         Grinding of wheat                                           **Physical**

10.       Melting snow                                                  **Physical**

11.       2 H2O  →        2 H2     +          O2    +     Energy                                  **Chemical**

12.       E    +     NaCl(s)           →          NaCl(aq)**Physical**

13.       Determine the physical state of each element at -5 0C (use the Handbook, Textbook, or Net to determine the melting point and boiling point of each).

                                                            mp                   bp                                physical state

a) Mercury                              **-38.87 oC                     356.58 oC        liquid**

b) Bromine                              **-7.2 oC                         58.78 oC          liquid**

c) Chlorine                              **-100 oC                        -34.6 oC           gas**

**Classify as a physical or chemical properties.**

14.       Sugar chars when heated                     **chemical property**

15.       Yellow color of sulphur                      **physical property**

16.       Tarnishing ability of sulphur               **chemical property**

17.       Flexibility of a spring                          **physical property**

18.       Thermal conductivity of iron               **physical property**

19.       Hardness of a diamond                        **physical property**

20.       Stability of nitrogen                             **chemical property**

21.       Describe 11 and 12 as exothermic or endothermic

**Write Ionic Formulas**

22.       Aluminum oxide                                  **Al2O3**

23.       Aluminum chloride                              **AlCl3**

24.       Ammonium acetate                              **NH4CH3COO**

25.       Barium phosphate                                **Ba3(PO4)2**

26.       Calcium hydroxide                              **Ca(OH)2**

27. Sodium hydroxide                                     **NaOH**

28.       Strontium phosphate                            **Sr3(PO4)2**

29.       Iron II phosphate                                 **Fe3(PO4)2**

30.       Cobalt III sulphate pentahydrate          **Co2(SO4)3.5H2O**

31.       Copper II nitrate hexahydrate              **Cu(NO3)2.6H2O**

**Write an equation**

32.       Sodium chloride dissolving in water (endothermic).

**NaCl(s)   +  energy   →   Na+(aq)   +   Cl-(aq)**

33.       Lead II nitrate reacting with sodium phosphate to produce solid Lead II phosphate and sodium nitrate (exothermic and three chemicals are             aqueous).

**3Pb(NO3)2(aq)  +  2Na3PO4(aq)     →    Pb3(PO4)2(s)    +   6NaNO3(aq)**

34.       List three chemical and physical properties.

**Chemical:                   reactivity        flammability               stability**

**Physical:                     mass                colour                          density**

1.         Label each as chemical or physical.

            a) Ice cubes turn to water                                **physical**

            b) Steam forms water droplets in a mirror      **physical**

            c) Milk is made into ice milk                          **physical**

            d) Ice cubes shrink in a freezer                       **physical**

            e) Perspiration “dries”                                   **physical**

            f) Bromine is liquefied from solid bromine    **physical**

2.         What change in physical state occurs during the formation of the following?

            a) Rain            **condensation**

            b) Snow           **freezing**

            c) Frost            **freezing**

            d) Steam          **evaporation**

3)         A sealed glass bulb is half-filled with water, on which some ice and wood are floating.  The remainder of the bulb is filled with air.  How many physical states are present?  Identify them.

**solid:   ice and wood**

**liquid:  water**

**Gas:    air and water vapour**

4)         Classify each of the following as a physical or chemical change.

a)         Photosynthesis (CO2   +   H2O   →        Sugars   +   oxygen)               **Chemical**

b)         Antifreeze boils out of a radiator                                                        **Physical**

c)         A firefly emits light                                                                             **Chemical**

d)         A nail is magnetized                                                                            **Physical**

e)         A nail rusts                                                                                          **Chemical**

f)         Leaves turn color in autumn                                                                **Chemical**

g)         Food spoils                                                                                         **Chemical**

h)         Dynamite explodes                                                                              **Chemical**

I)         Grinding of wheat into flour                                                                **Physical**

j)         Shattering of glass                                                                               **Physical**

k)         Extraction of iron from iron ore (Fe2O3)                                             **Chemical**

5)         Identify the chemical and physical changes in the following sequences:

a)         A lump of sugar is ground to a powder **Physical** and then heated in air **Physical**.  It melts **Physical**, then darkens **Chemical**, and finally bursts into flames and burns **Chemical.**

b)         Gasoline is sprayed into the carburetor **Physical**, mixed with air **Physical**, converted to vapor **Physical**, burned **Chemical**, and the combustion roducts expand the cylinder **Physical**.

**Balancing Equations**

**1.         2KNO3                        →                    2KNO2            +          O2**

**2.         CaC2   +          2O2         →    Ca                   +          2CO2**

**3.         C5H12  +          8O2         →    5CO2   +          6H2O**

**4.         K2SO4+          ­BaCl2              →        2KCl   +          BaSO4**

**5.         2KOH +          H2SO4             →        K2SO4 +          2H2O**

**6.         Ca(OH)2         +          2NH4Cl           →        2NH4OH         +          CaCl2**

**7.         5C       +          2SO2       →    CS2      +          4CO**

**8.         Mg3N2+          6H2O    →      3Mg(OH)2     +           2NH3**

**9.         V2O5   +          5Ca         →    5CaO  +          2V**

**10.       2Na2O2+          ­2H2O     →     4NaOH           +          O2**

**11.       Fe3O4  +          4H2        →      3Fe      +          4H2O**

**12.       Cu       +          2H2SO4           →      CuSO4  +       2H2O        +    SO2**

**13.       2Al      +          3H2SO4           →        3H2      +          Al2(SO4)3**

**14.       2Si4H10            +          13O2       →    8SiO2  +          10H2O**

**15.       4NH3   +          O2                    →       2N2H4 +          2H2O**

**16.       2C15H30           +          45O2      →     30CO2 +          30H2O**

**17.       2BN                 +          3F2  →                 2BF3+          N2**

**18.       CaSO4 .2 H2O    +     2SO3               →            CaSO4        +          2H2SO4**

**19.       2C12H26           +          37O2       →    24CO2 +          26H2O**

**20.       C7H6O3           +          7O2         →      7CO2    +       3H2O**

**21.       9Na                 +          4ZnI2→        8NaI                +          NaZn4**

**22.       3LiAlH4          +      4BF3        →        3LiF     +    3AlF3      +   2B2H6**

**23.       HBrO3                +       5HBr              →        3H2O              +          3Br2**

**24.       15O2   +      2All4C3   +          54H2O            →         28Al(OH)3   +   6CH4**

**25.       2Ca(NO3)2 .3H2O  +  3LaC2  →  2Ca(NO3)2   +  3La(OH)2   +   3C2H2**

**26.       1CH3NO2       +   3Cl2   →     1CCl3NO2  +         3HCl**

**27.       Ca3(PO4)2   +   3SiO2   +   5C   →   3CaSiO3   +   5CO   +   2P**

**28.       Al2C6   +   6H2O         →   2Al(OH)3   +        3C2H2**

**29.       2NaF   +          CaO   +   H2O            →        CaF2   +   2NaOH**

**30.       4LiH   +          AlCl3               →        LiAlH4             +          3LiCl**

**31.       2CaF2   +   2H2SO4  +   SiO2   →      2CaSO4   +     SiF4   +   2H2O**

Some Tough Ones

**Sorry, you are going to have to figure these out for yourself! Good luck!**

\_\_\_FeCl2  +   \_\_\_KNO3+       \_\_\_HCl →  \_\_\_FeCl3  + \_\_\_NO   +\_\_\_ H2O  +   \_\_\_KCl

\_\_\_Cu   +         \_\_\_HNO3                   →       \_\_\_Cu(NO3)2   +     \_\_\_NO   +     \_\_\_H2O

\_\_\_ KMnO4     +   \_\_\_ HBr     →         \_\_\_MnBr2   +   \_\_\_Br2   +   \_\_\_KBr   +   \_\_\_H2O

\_\_\_ K2Cr2O7   +           \_\_\_HCl   →      \_\_\_KCl   +   \_\_\_CrCl3   +   \_\_\_H2O   +   \_\_\_Cl2

**Assignment # 5            Balancing Equations Naming Formulas**

6.         Classify the following as elements, compounds, or mixtures:

a)         Methane  (CH4)                       **compound**

b)         Pizza                                        **mixture**

c)         Milk shake                               **mixture**

d)         Zinc                                         **element**

e)         Laughing gas                            **compound**

f)         Clean air                                 **mixture**

g)         Chocolate chip cookie             **mixture**

7.         A pure blue powder when heated in a vacuum releases a greenish colored gas and leaves behind a white solid.  Is the original blue powder a compound or element?  Explain.

**Compound, because it decomposed into two elements.**

8.         A shiny, metallic-like substance conducts an electric current without a change in its properties.  The substance is heated until it liquefies and then   an electric current is passed through the liquid again without a change in properties.  Is the substance likely to be an element or compound? Explain.

**Element, because it could not be decomposed by electrolysis or heating.**

9.         Describe the difference between chemical and physical change in terms of what occurs with the atoms involved.

**Chemical change involves chemical bonds being broken and new ones being formed.**

**Physical change involves changes in state (s), (l), (g), and (aq). Chemical bonds are not broken.**

**1.         2Al      +          6HCl               →        2AlCl3 +          3H2**

**2.         Zn        +          2KOH             →        K2ZnO2   +      H2**

**3.         B2O3   +          3Mg                →        3MgO +          2B**

**4.         2C6H11OH      +          17O2   →        12H2O  +        12CO2**

**5.         2C12H26           +          37O2→        26HOH   +    24CO2**

**6.         2Na     +          2H2O              →        2NaOH           +          H2**

**7.         2PbS   +          3O2                 →        2PbO  +          2SO2**

**8.         SiCl4    +          4Na                 →        Si         +          4NaCl**

**9.         2Mg    +          CO2                 →        2MgO +          C**

**10.       2Al      +          3H2SO4           →        Al2(SO4)3  +   3H2**

**Write Formulas for each**

11.       Zinc phosphate                                                **Zn3(PO4)2**

12.       Ammonium carbonate                                      **(NH4)2CO3**

13.       Iron III oxalate                                     **Fe2(C2O4)3**

14.       Copper II tripolyphosphate pentahydrate        **Cu5(P3O10)2.5H2O**

15.       Cobalt II borate                                               **Co3(BO3)2**

16.       Triphosphorus tetroxide                                  **P3O4**

17.       Dicarbon hexachloride                                    **C2Cl6**

18.       Trisilicon octafluoride                                                **Si3F8**

19.       Sodium tetraborate                                          **Na2B4O7**

20.       Aluminum dichromate                         **Al2(Cr2O7)3**

21.       Calcium oxide                                                 **CaO**

22.       Silver thiosulphate                                          **Ag2S2O3**

**Write balanced chemical equations and include phase symbols for each formula.**

23. Aqueous calcium nitrate is reacts with a solution of sodium phosphate producing solid calcium phosphate and aqueous sodium nitrate.

**3Ca(NO3)2(aq)     +    2Na3PO4(aq)   →   Ca3(PO4)2(s)    +   6NaNO3(aq)**

24. Gaseous nitrogen trihydride reacts with oxygen gas to produce gaseous nitrogen monoxide and gaseous water and energy.

**4NH3(g)+   5O2(g)   →     4NO(g)  +  6H2O(g)   +  energy**

25. Phosphoric acid reacts with Calcium hydroxide both in solution to produce and aqueous salt and water.

**2H3PO4(aq)   +  3Ca(OH)2(aq)   →       Ca3(PO4)2(aq)  +  6H2O(l)**

26. Write an equation for the combustion of sucrose.

**C12H22O11(s)   +  12O2(g)   →  12CO2(g)   +   11H2O(l)**

27. Write an equation for the cellular respiration of vitamin C.

**C6H8O6(s)   +  5O2(g)   →  6CO2(g)   +   4H2O(l)**

28. Describe what you know about covalent or molecular compounds.

**Formula starts with a nonmetal**

**Shared electrons**

**Full valance shells**

**Stable compounds**

**Worksheet # 6**            **Balance each equation.**

**1.         2Sb                  +          5Cl2                 →        2SbCl5**

**2.         2FeCl2+          Cl2                   →        2FeCl3**

**3.         2P                    +          3I2                   →        2PI3**

**4.         Na2S                +          2HCl               →        2NaCl             +          H2S**

**5.         3NaOH           +          FeCl3               →        3NaCl +          Fe(OH)3**

**6.         3KOH             +          H3PO4             →        K3PO4 +          3H2O**

**7.         2NaOH           +          CuSO4            →        Na2SO4   +Cu(OH)2**

**8.         2HNO3            +          Ca(OH)2        →        2H2O  +       Ca(NO3)2**

**9.         2NH3               +          3CuO              →        3H2O  +   3Cu            +   N2**

**10.       N2        +    4C    +       Na2CO3          →        2NaCN            +    3CO**

**11.       2NH3               +          5O                   →        2NO    +          3H2O**

**12.       4NH3               +          7O2                 →        4NO2   +          6H2O**

**13.       2NH3               +          4O2                 →        N2O5   +          3H2O**

**14.       2P                    +          5N2O               →        P2O5    +          5N2**

**15.       2Al                  +          6HCl               →        2AlCl3 +          3H2**

**16.       Zn                    +          2KOH             →        K2ZnO2  +      H2**

**17.       B2O3               +          3Mg                →        3MgO +          2B**

**18.       2CH3OH         +          3O2                 →        4H2O  +          2CO2**

**19.       C6H12O6                                             →        2C2H5OH   +    2CO2**

**20.       2Na     +          2H2O                          →        2NaOH           +          H2**

**21.       2PbS               +          3O2                 →        2PbO  +          2SO2**

**22.       SiCl4    +          4Na                             →        Si         +          4NaCl**

**23.       2Mg    +          CO2                             →        2MgO +          C**

**24.       2Al      +          3H2SO4                       →        Al2(SO4)3   +   3H2**

**Write balanced chemical formulas for each ionic compound.**

25. Calcium hydroxide                        **Ca(OH)2**

26. Aluminum sulphate                        **Al2(SO4)3**

27. Iron III oxide                                 **Fe2O3**

28. Zinc acetate                                   **Zn(CH3COO)2**

29. Barium carbonate                          **BaCO3**

30. Sodium phosphate                         **Na3PO4**

31.Cobalt II nitride                              **Co3N2**

32. Gallium sulphate                           **Ga2(SO4)3**

33. Aluminum fluoride                        **AlF3**

34. Ammonium sulphate          **(NH4)2SO4**

35. Aluminum acetate                          **Al(CH3COO)3**

**Write balanced chemical formulas for each molecular (covalent) compound.**

36. carbon monoxide                           **CO**

37. dinitrogen tetraiodide                    **N2I4**

38. triphosphorus hexafluoride            **P3F6**

39. dinitrogen dioxide                         **N2O2**

**Write balanced chemical equations for each word equation. Include phase symbols for all formulas.**

40. Solid sodium oxide dissolves in water to make sodium oxide solution.

**Na2O(s)**            **→        2Na+(aq)+O2-(aq)**

41. Solid aluminum sulphate dissolves in water to make a solution

**Al2(SO4)3(s)**     **→        2Al3+(aq)+          3SO42-(aq)**

42. Barium phosphate plus sodium sulphate (both in water) yields solid barium sulphate and aqueous sodium phosphate.

**Ba3(PO4)2(aq)  +  3Na2SO4(aq)** **→  3BaSO4(s)  +  2Na3PO4(aq)**

43. Lead metal added to Sulphuric acid solution produces lead IV sulphate precipitate and diatomic hydrogen gas.

**Pb(s)  +  2H2SO4(aq)**  **→  Pb(SO4)2(s)  +  2H2(g)**

44. Potassium iodide (aq) plus lead II nitrate (aq) yields potassium nitrate (aqueous) plus lead II iodide (solid).

**2KI(aq)  +  Pb(NO3)2(aq)**  **→  2KNO3(aq)  +  PbI2(s)**

45. Calcium carbonate (solid) plus aqueous hydrochloric acid yields (aqueous) calcium chloride, carbon dioxide gas and water.

**CaCO3(s)  +  2HCl(aq)**  **→  CaCl2(aq)  +  CO2(g)  +H2O(l)**

46. Potassium nitrate (aq) plus iron III hydroxide (aq) yields iron III nitrate (aq) plus potassium hydroxide (aq).

**3KNO3(aq)  +  Fe(OH)3(aq**)  **→  Fe(NO3)3(aq)  +  3KOH(aq)**

**You are good if you can do these. On your own of course!**

1.         \_\_\_HCl    +   \_\_\_\_K2CrO4   **→** \_\_\_\_KCl   + \_\_\_\_CrCl3    +\_\_\_\_H2O      +\_\_\_\_Cl2

2.         \_\_K2Cr2O7  +  \_\_KI   +  \_\_H2SO4**→**\_\_K2SO4  + \_\_Cr2(SO4)3+ \_\_\_I2 +\_\_\_H2O

**Worksheet # 7            Measurement and Uncertainty**

1. Five different voltmeters are used to measure the voltage in a circuit. Determine the average and uncertainty.

25.61V

25.63V

25.65V                        **25.63 ± 0.02 V**

25.64V

25.63V

Six thermometers give the following readings. Determine the average and the uncertainty.

352.4 0C

352.5 0C

352.6 0C

352.5 0C

352.7 0C

352.6 0C

2.         Determine the average and uncertainty for the data:

            25.56 g            25.54g             25.52g             25.53g             25.55g

Answer            **25.54** **±  0.02 g**

3.         Determine the average and uncertainty for the data:

            5.216 oC         5.218 oC         5.213 oC         5.214 oC         5.416 oC

            Answer

4. How many significant figures are in each number?

25.63               **4**                                  101                  **3**                      0.0075             **2**

0.0002             **1**                                  1.00                 **3**                      2.005               **4**

10.031             **5**                                  1.0002             **5**                      10005              **5**

0.00521           **3**                                  2.51 x 104        **3**                      3 x 10-7            **1**

2 x 105             **1**                                  2.00 x 103        **3**                      250.                 **3**

5. Round off to three significant figures.

0.05211                       **0.0521**                                    0.0087251                   **0.00873**

85.337                               **85.3**                                        2.6177 x 10-5**2.62 x 10-5**

2.5175 x 10-18**2.52 x 10-18**25.731 x 105                 **2.57 x 106**

Round off each measured number to three significant figures.

6.         0.002567                                 **.00257**

7.         94549                                      **9.45 x 104**

8.         15.00                                       **15.0**

9. Round off the following numbers to three significant figures:

a)         35.234      **35.2**                                    b)         2.34521                       **2.35**                             c)         0.035219         **0.0352**

d)         2533521   **2530000**                             e)         6255520000                **6260000000**

10. State the number of significant figures in each approximate number.

a)         305                  **3**          b)         25.25               **4**                      c)         3.00     **3**

d)         0.001               **1**          e)         3.0050  **5**

f)         6.25 x 1023**3**g)         7.00 x 10-2       **3**                      h)         1001    **4**

11. Add or subtract the measured quantities.

   25.31                           22.0                          22.7                             35.271

+   6.4                          +   0.04                    +    0.77                      +     0.2

**31.7                             22.0                          23.5                             35.5**

 22.71                            25.217                         2.51639                       8.0558

- 0.299                         + 0.017                  -     1.2358                    +     .3259297

**22.41**                             **25.234**                       **1.2806                         8.3817**

25.634   +  2.365  -   0.25498  +  0.225  =                                          **27.969**

12.       15.239  +  5.36                                                                        **20.60**

13.       2.6679   -    1.23                                                                      **1.44**

14.       2.059378  x  1024    +   5.3    x   1022                                       **2.112 x 1024**

15.       8.5  x  10 -24    +   5.37894    x   10-25                                     **9.0 x 10-24**

16.       2.3  x  10 16    +   8.224    x   1019                                            **8.226 x 1019**

17.       5.6  x  10 –8    +   9.5563    x   10-6                                           **9.612 x 10-6**

18.       9.55  x  10 -10    +   5.4455    x   10-12                                       **9.60 x 10-10**

19.       2.66  x  10 -16    +   3.445    x   10-18                                         **2.69 x 10-16**

**20.       3CaSi2   +       2SbCl3   →      6Si   +              2Sb   +             3CaCl2**

**21.       2TiO2      +     B4C     +     3C             →         2TiB2   +   4CO**

**22.       4NH3   +          5O2     →        4NO   +           6H2O**

**23.       SiF4     +   8NaOH   →        Na4SiO4     +      4NaF   +   4H2O**

**24.       2NH4Cl   +      CaO   →   2NH3   +  CaCl2   +   H2O**

**25.       4NaPb   +   4C2H5Cl   →   Pb(C2H5)4   +   3Pb   +   4NaCl**

**26.       Be2C               +   4H2O   →   2Be(OH)2   +   CH4**

**27.       4NpF3   +   O2   +   4HF   →   4NpF4   +   2H2O**

**28.       3NO2   +   H2O   →   2HNO3  +         NO**

**Worksheet # 8**

1.         25  x 3                         2.  3.35  x  0.26                       3.  799  x  877

**8  x  101 or  80                        0.87                                  7.01  x  105 or  701000**

4.         (6.2 x 103)( 3.55 x 1012)                      5.         (6.3 x 107)(2.51 x 10-7)

                                                                                                (3.214 x 10-5)

**2.2  x  1016                                                      4.9  x  105**

6.         (7.52 x 1016)(3.1 x 1012)                      7.         3.5 x 102÷  3.1 x 103

            (2.5 x 10-7)

**9.3  x  1035                                                      1.1  x  10-1**

8. (2.00 x 1023)(3.51 x 10-22)(3.5 x 103)

(7.5 x 10-3)(3.511 x 1012)(6.6 x 10-6)

**1.4**

9.  (5.200 x 10-5)(6.02 x 10-12)(3.58 x 1017)

(2.337 x 10-3)(6.2154 x 1012)(5.22 x 10-12)

**1.48  x  103**

10.       156   x   256   x  21   x  0.0005687

0.02569   x   13.235   x   2654

**0.53**

11.       (8.5  x  10 -24)  ( 5.37894    x   10-25)   ( 4.532    x   1015)

             (2.059378  x  10 24)  (5.3    x   1022)  ( 9.37894    x   10-13)

**2.0  x  10-67**

12.       25.7 x  0.21                 **5.4**

13        35 x 105                      **3.7  x  103**

14.       51.71 x  22.3                **1.15  x  103**

15.       22 x 305                      **6.7  x  103**

16. Write three examples of exact numbers.

**6 fish   8girlfriends     3pens**

17. Write three examples of approximate numbers.

**1.2 cm             2.45 Kg           2.233 V**

**Circle** the uncertain digit and underline the uncertainty in each of the following numbers.

**18.       35.2± 0.1 g                19.        22.221 ± 0.005 mm                20.         100. ± 2 lb.**

21. Give the largest and smallest value of the approximate number

 35.21 ± 0.02 g                        **largest: 35.23 g                      smallest: 35.19 g**

22.          26.215                      23.    65.222                            24.    22  -  0.01

              -  0.3                                 +  1.03

**25.9                                   66.25                                          22**

25.          10. + 0.1                   26.  33.3  +  0.35                     27.  29.39  + 0.2

**10.                                        33.7                                         29.6**

 Calculate the average measurement and the uncertainty of each measuring device below:

28. The mass (in grams) readings on a balance:

58.56

58.59

58.51

58.61

58.57

58.56

Answer            **58.6  ±  0.1 g**

29. The voltage (in mV) readings on a number of voltmeters:

123.2

            124.5

124.0

124.3

124.3

Answer            **124.3  ±  0.3 mV**

30. State the number of significant digits for each number:

a)  0.00200 L    **3**         b)         5.000 g            **4**          c)         1.00003 A **6**

d)  1000.000 Mm   **7**  e)         2.5 x 1076**2**f)         78.89 m     **4**

31. Perform the following calculations and round to the appropriate level of uncertainty (assume all numbers are from measurements):

a)         18 + 0.21                                             **18**

b)         62.1  x  3021.56                                  **1.88  x  105**

c)         1.05 g + 253.8 mg + 24.98 mg **Watch units!**

            1.05

            0.2538

            0.02498

**1.32 g**

d)         (9.442 x10-3)(3.21 x108)                    **3.03  x  106**

e)         231.4  -  8.2295                                   **223.2**

f)         (8.995 x106) + (3.55 x107)                   **4.45  x  107**

g)         12.0355 + 1.024                                  **13.060**

h)         (4.56 x10-8)(2.5  x1035)                      **1.1  x  1028**

i)         (9.24 x 1010)(5.233  x104)                   **4.84  x  1015**

32. State the difference between accuracy and precision.

**Accuracy refers to how close a measurement is to the true or accepted value.**

**Precision is the opposite of uncertainty and refers to the variation of a measurement with different measuring devices.**

**The lower the variation the greater the precision and the higher the uncertainty.**

**Worksheet # 9         Unit Analysis 1**

**All work must be shown as illustrated below. The work is more important than the answer.**

1.         527 g to mg

**527 g  x  1 x  103 mg               =          5.27  x  105 g**

**1g**

2.         1.05  x  106 um to m

**1.05  x  106 μm  x        1 g                  =          1.05 m**

**1  x  106 μm**

3.         2.148 ML to mL

**2.148 ML        x          1  x  106 L       x          1  x  103 mL    =          2.148  x  109 mL**

**1ML                              1L**

4.         0.0235 mg to Kg

**0.0235 mg       x          1g                    x          1kg                  =          2.35  x  10-8 kg**

**1  x  103 mg                 1  x  103 g**

5.         8.32  x 10-4  mL  to ML

**8.32  x 10-4  mL  x      1 L        x        1 ML              =          8.32  x  10-13 ML**

**1  x  103 mL    1  x  106 L**

6.         772.5 us to ms

**772.5  μs         x          1 ms                =          0.7725 ms**

**1  x  103 μs**

7.         3.06500 cg to kg

**3.06500  cg     x          1 g                   x          1 kg                 =          3.06500  x  10-5 Kg**

**1  x  102 cg                  1  x  103 g**

8.         9.450 Mm to mm

**9.450 Mm       x          1  x  106 m       x  1  x  103 mm            =          9.450  x  109 mm**

**1Mm                     1 m**

9.         5.64  x  103  mm2 to cm2

**5.64  x  103  mm2         x          1 cm2               =          5.64  x  101cm2**

**1  x  102 mm2**

1.         605 µm  to mm

**0.605 mm**

2.         6.5  x  10-6   Mm  to m

**6.5 m**

3.         20.0 km  to cm.

**2.00  x  106 cm**

4.         8.774  x  1015  µm to Mm.

**8774 Mm**

5.         25 cL  to  ML

**2.5  x  10-7 ML**

6.         648 kPa  to  mPa

**6.48  x  108 mPa**

7.         2.665  Mg  to  µg

**2.665  x  1012 μg**

**Worksheet # 10**

Use unit analysis and the conversion factors to perform the following conversions:

2.210 lb  =  1.000 kg               14 lb  = 1 stone (defined)        2000 lb   =  1 ton (defined)

1.61 km   =   1.00 mile            4.54 L  =  1.00 gallon              16 oz  =  1 lb (defined)

1.       170 lb to kg

**170 lb x          1 kg         =    76.9 kg**

**2.210 lb**

2.       648 KPa to atm

**648 kpa     x     1 atm             =          6.40 atm**

**101.3 kpa**

3.       256 oz to tons

**256 oz             x          1 lb         x       1 ton    =          8.00  x  10-3  tons**

**16 oz               2000 lb**

4.       0.025 ton to mg

**0.025 ton  x  2000 lb    x   1 kg   x   1  x  103 g   x     1  x 103 mg   =    2.3  x  107  mg**

**1 ton           2.21 lb      1 kg                    1 g**

5.       0.236 Gal to mL

**1.07  x  103 mL**

6.       5.8 x 106 mL to Gal

**1.3  x  104 Gal**

7.       5.66 x 106 mg to stones

**0.893 stones**

8.       15 miles to mm

**2.4  x  107 mm**

9.       5.63 x 109 µm to miles

**3.50 miles**

10.         152 mL to gal

**152 mL  x       1 L         x       1 gal    =          3.35  x  10-2  gal**

**1000 mL         4.54 L**

11.         8.6 stone to oz

**256 stone  x    14 lb       x       16 oz   =          1.9  x  103  oz**

**1 stone             1 lb**

12.       4.3 m to miles

**4.3 m  x           1 Km      x       1.00 mile         =          2.7  x  10-3  miles**

**1000 m            1.61 Km**

13.       15.2 mi/gal to L/km

**1 gal          x    4.54 L    x       1 mi                 =          0.186 L/km**

**15.2 mi            1 gal                1.61 km**

14.       2.3  gal to mL

**1.0  x  104 mL**

15.       45.2 oz to stones

**0.202 stones**

15.       46.3 miles to m

**7.45  x  104 m**

17.       36 L/km to mi/gal

**0.078  mi/gal**

18.       If 3 dogs are worth 2 cats, 8 cats are worth 2 lions, 5 lions are worth 8 elephants, 2 elephants are worth 8700000 ducks, 47 ducks are worth 63 geese, 14 geese are worth 27 snakes, 42 snakes are worth 778396 fruit flies, and a dog costs  $205.00, how much does a fruit fly cost? Use unit analysis and assume all conversions are exact.

**1 FF  x  42 sn       x    14 ge  x 47 du x  2 el                x  5 li   x  8 ca x  3 do  x $205.00**

**778396 FF      27 sn     63 ge     8700000 du        8 el      2 li       2 ca       1 dog**

**$ 4  x  10-9  for  one fruit fly**

19.       Light travels 9.46 x 1015 m in one year. This distance is called a light-year. Calculate the speed of light in metres per second. Use unit analysis.

**3.00  x  108 m/s**

20.       The following trade ratios are used in a small country in the Middle East near Iran called Yrtsimehc.  A young man is in love with a beautiful woman, however, he must pay a dowry of 12 camels to marry her.  The young man is a yam farmer and has only 12,000 yams to trade.  Can he marry his true love?

Use unit analysis to support your answer.

            15 pigs = 2 cows         3 cows = 2 horses       17 chickens = 1 pig

            2 horses = 3 camels     20 lbs of figs = 16 chickens    56 yams = 10 lbs of figs

**1.3 x 102 camels  Yes he can marry and have camels left over for the honeymoon.**

**Worksheet # 11            Review**

|  |  |  |  |
| --- | --- | --- | --- |
| Given: | $0.2045 Can. | = | 1.00  Francs (French) |
|  | $2.1860 Can. | = | £ 1.00 (UK) |
|  | $1.3572 Can. | = | $ 1.00 U.S. |
|  | $0.1534 Can. | = | 1.00 Peso (Mexico) |
|  | $0.0109 Can. | = | ¥ 1.00 (Japanese Yen) |
|  | $0.0263 Can. | = | 1.00 Rupee (India) |
|  | $1.00 U.S. | = | 1.9325 Marks (Germany) |

Convert:

1.      $300.00 Can. to £.

**137.24 £.**

2.      $1025.00 Can. to pesos.

**6681.88 pesos**

3.      $450.00 U.S. to yen.

**56031 yen**

4.      £ 652.23 to francs.

**6972.0 francs**

5.      85.2 Marks to £.

**27.4 £**

6.      3842.35 Yen to Rupees.

**1592.46 Rupees**

7.      9668.75 Francs to Marks.

**2815.39 marks**

**Black Market Trading Conversions**

|  |  |  |  |
| --- | --- | --- | --- |
| Given: | 1 Ticket | = | 2 CDs |
|  | 5 Buttons | = | 3 T Shirts |
|  | 4 Tickets | = | 1 Back Stage Pass |
|  | 1 CD | = | 3 T Shirts |
|  | 7 Posters | = | 3 Buttons |

Convert:

1.                      28 Posters to buttons.

**28 Pos             x          3 But               =          12 buttons**

**7 Pos**

2.                      10. CDs to tickets.

**10 CD             x          1 ticket           =          5.0 tickets**

**2 CD**

3.                      100. Buttons converted to CDs.

**20.0 CDs**

4.                      1 Back Stage Pass converted to T Shirts.

**24 T-shirts**

5.                      280. Posters to Back Stage Passes.

**3.00 BSP**

6.                      6 Back Stage Passes to buttons.

**240 buttons**

Use unit analysis to perform the following conversions:

7.         6.372 hL to mL

**6.372 hL    x    1  x  102 L      x  103 mL=      6.372  x  105 mL**

**1 hL                   1 L**

8.         4.9 x 1015 µg to Mg

**4.9  x  103 Mg**

9.         8.774 x 103 cm3 to m3

**8.774  x  10-3 m3**

10. Given the following relationships, determine how many zings can be obtained when you trade 20.6 balls.

*4 clangs  = 3 dangs    7 dangs  = 3 jars        2 balls  = 5 clangs      6 jars  = 1 zing*

**2.76 zings**

11. State the number of significant digits for each number:

      a)  25.0 g               b)       1000 g              c)  25.036 A                d)  5.214  x  10-62  mL

                                                1 kg

**3                                        infinite                        5                                              4**

e) 0.0000005 L                              f) 8.2000 m

**1                                                    5**

Determine the average and uncertainty given the following measurements from a

12.       Centigram balance

82.62 g

82.54 g

82.48 g            **82.6  ±  0.1 g   Note the uncertainty is in the first decimal place.**

82.72 g

82.65 g

13.       Show the interval on the number line that represents the range for the above measurement after it has been round off correctly.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  | http://iannonechem.com/Sc/workbookanswers/2.answers_files/image002.gif | | | | | | |
|  |  |  |  |  |  |  |  |
|  |  | |  | | --- | | **82.5** | |  | |  | | --- | | **82.6** | |  | |  | | --- | | **827** | |  |

Write chemical formulas for each ionic or molecular compound.

14.       Iron III oxide                                       **Fe2O3**

15.       Triphosphorous hexoxide                    **P3O6**

16.       Aluminum hydroxide                           **Al(OH)3**

17.       Nickel II phosphate octahydrate          **Ni3(PO4)2 . 8H2O**

Name each chemical formula

18.       K3PO4                                                  **Potassium phosphate**

19.       Mn3P2                                                  **Manganese II phosphide**

20.       Ga2(SO3)2**.**6H2O                                **Gallium sulphite hexahydrate**

21.       P4O10                                                   **tetraphosphorus decoxide**

**Worksheet # 12         Density Calculations**

**Density calculations**

1.         Calculate the volume in cm3 of 25.3 g of iron.

**25.3 g     x     1 cm3                 =          3.22 cm3**

**7.87 g**

2.         Calculate the mass of 65 cm3 of iron in mg.

**65 cm3             x       7.87 g             x      1000 mg        =          5.1 x 105 mg**

**1 cm3**                  **1g**

3.         Calculate the density of an expensive element that has a mass of 56.76 g and a volume of 2.938 cm3. Determine the identity of the element.

**D         =          56.76 g            =          19.32 g/cm3**

**2.938 cm3**

**Au**

4.         Calculate the density of a radioactive element that has a mass of 164.3 g and a volume of 8.693 cm3. Determine the identity of the element.

**D         =          164.3 g            =          18.90 g/cm3**

**8.693 cm3**

**U**

5.         Determine the volume in mm3 of a 55.3 g sample of lead.

**55.3 g     x     1 cm3       x        1000 mm3        =          4.88   x  103 mm3**

**11.34 g              1 cm3**

6.         Determine the mass of a 59.3 mm3 sample of lead.

**59.3 mm3         x          1 cm3               x          11.34 g                        =          0.672 g**

**1000 mm3                    1 cm3**

7.         Determine the volume in mm3 of a 1.0 x 10-8 ton sample of gold.

**1.0 x 10-8 ton   x   2000 lb   x    1.00 kg   x   1000 g    x    1 cm3    x    1000 mm3     =   0.47 mm3**

**1 ton             2.21 lb          1 kg           19.32 g          1 cm3**

**Worksheet 13         Practice Test**

Balance each equation.

1.         **2**Sb                  +          **5**Cl2                 →                    **2**SbCl5

2.**2**NH3   +          **4**O2                  →        N2O5    +          **3**H2O

3.         **2**C12H26            +          **37**O2               →        **24**CO2 +          **26**H2O

4.         **2**Al       +         **3**H2SO4       **→        3**H2      +          Al2(SO4)3

            (The next one is the tough one!!)

5.         **3**Cu    +           **8**HNO3       **→**        **3**Cu(NO3)2   +    **2**NO     +      **4**H2O

            Write a **balanced** equation for each word equation including **phase** symbols.

6.         Barium phosphate plus sodium sulphate (both in water) yields solid barium sulphate and aqueous sodium phosphate.

**Ba3(PO4)2(aq)  +  3Na2SO4(aq)  →  3BaSO4(s)+  2Na3PO4(aq)**

**Write chemical formulas for each ionic or molecular compound**.

7.         Mercury II sulfide                                                       **HgS**

8.         Diphosphorous pentoxide                                            **P2O5**

9.         Barium hydroxide                                                        **Ba(OH)2**

10.       Copper II sulphate hexahydrate                                   **CuSO4.6H2O**

Name each chemical formula

11.       Na3PO4                                                            **sodium phosphate**

12.       Co3P2                                                               **cobalt II phosphide**

13.       Al2(CO3)2**.**6H2O                                             **aluminum carbonate hexahydrate**

14.       Si2I6                                                                 **disilicon hexaiodide**

15.       Determine the average and uncertainty for the data:

            25.56g

            25.54g

            25.52g

            25.53g

            25.55g

Answer            **25.54  ±  0.02g**

16.       Determine the average and uncertainty for the data:

            5.216 oC

            5.218 oC

            5.213 oC

            5.214 oC

**5.416 oC          reject**

Answer            **5.215  ±  0.003 oC**

Round off each measured number to three significant figures.

17.       0.002567                     **0.00257**

18.       94549                          **94500              or        9.45  x  104**

19.       15.00                           **15.0**

Add or subtract the measured quantities.

20.       15.239  +  5.36                                                            **20.60**

21.       2.6679   -    1.238                                                        **1.430**

22        12.65449   +   0.2493**12.9038**

23.       8.57  x  107   +   5.37894    x   109                               **5.4646  x  109**

            Simplify the following rounding to the correct number of significant figures.

24.         156   x   256   x  21   x  0.0005680

                .02569   x   13.235   x   2654                                  Answer **0.53**

25.       (8.5  x  10 -24) (5.37894   x  10-25) ( 4.532  x  1015)

            (2.059378  x 10 24)  (5.3   x  1022)  (9.37894   x  10-13)

                                                                                                Answer **2.0  x  10-67**

                        Complete the relationships:

26.       **1** Mg                =          **1  x  106** g                    27.       **1** Km               =          **1  x  103** m

28.       **1** L                   =          **1  x  103** mL                 29.       **1** g                   =          **1  x  109** ng

30.       **1  x  106** µs      =          **1** s                               31.       **1  x  102**cg       =         **1** g

32.       **1  x  1012**pg     =          **1** g                               33.       **1  x  1012** s       =          **1**Ts

                        Use unit analysis to perform the following conversions:

34.       8.13 kg to cg.

**8.13  x  105 cg**

35.       2.3 x 1012 µm to Mm.

**2.3 Mm**

36.       1.52 x 104 Mm to mm.

**1.52 x 1013 mm**

37.       2.13 Mg to cg.

**2.13 x 108 cg**

38.       8.88 x 1012 mm to Mm.

**8.88 x 103 Mm**

39.       8.52 x 10-8 Mm to pm.

**8.52 x 1010 pm**

Use unit analysis and the conversion factors to perform the following conversions:

2.210 lb  =  1.000 kg               14 lb  = 1 stone (defined)        2000 lb   =  1 ton (defined)

1.61 km   =   1.00 mile            4.54 L  =  1.00 gallon              16 oz  =  1 lb (defined)

40.       635 mL to gal

**0.140 gal**

41.       3.8 stone to oz

**8.5  x  102 oz**

42.       25.6 m to miles

**0.0159 miles**

43.       26 mi/gal to L/Km

**1 gal   x    4.55 L   x   1 mi                 =          0.11 L/Km**

**26mi        1gal             1.61 km**

44.       14.5 L/Km to mi/gal

**1 Km               x          4.54 L    x       1 gal                =          0.194 mi/gal**

**14.5 L                         1 gal                1.61 km**

45.       Mr. Iannone’s chemistry class is at a “Periodic Table” party.  Everyone at the party is hungry, and they decide as a group that everyone wants sushi, california rolls.  No one at the party has any money though.  One bright student remembers that the class has a credit for 15 pizzas at Boston Pizza.  Using the conversion factors below, will Mr. Iannone’s class be able to buy enough California rolls for their “Periodic Table” party if there are 28 students at the party? Assume all conversions are exact.

            1 pizza = 2 Wendy’s burgers                           100 brussel sprouts = 3 pieces of toast

            5 pieces of toast = 1 california roll                 30 tacos = 1 bag of Doritos

            4 Wendy’s burger = 7 tacos                            6 bowls of lime jello = 3 bag of Doritos

            1 bowl of lime jello = 1000 brussel sprouts

**15 Pizzas x  2 WB  x  7 Tacos  x  1 Bag D x  6 Lime Jello  x  1000 Brussels  x  3 Toast  x  1 Cal Roll = 21 Cal Rolls**

**1 Pizz       4 WB                       30 Tacos     3 Bag D          1 Lime Jello      100 Brussels   5 Toast**

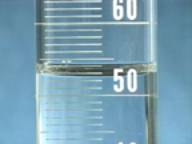
**Sorry, the answer is no.**

Read each scale and estimate the measurement to the correct number of significant figures.

46.          **6.62 mL**

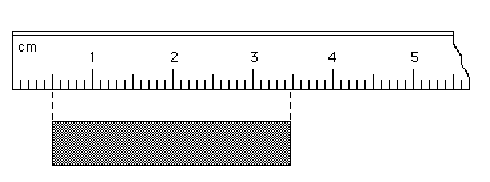
**47.** **52.5 ml**

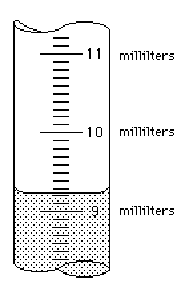
48. **21.5 mL**



49.**2.97 cm**



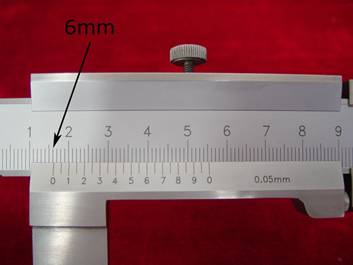
50.                                                                             **9.23 mL**

  51.       Micrometer Scale in mm.                            **5.78 mm**

[](http://upload.wikimedia.org/wikipedia/commons/e/e6/578metric-micrometer.jpg)

52.       Vernier Scale in cm.   **1.63 cm**



53.       Micrometer Scale in mm                            **10.93 mm**



54.       Calculate the volume in cm3 of 65.3 g of copper.

**7.29 cm3**

55.       Calculate the mass of 208 cm3 of copper in mg.

**1.86 x 106 mg**

56.       Calculate the density of an explosive element when wet that has a mass of 46.26 g and a volume of 24.70 cm3. Determine the identity of the element.

**1.873 g/cm3**

57.       Calculate the density of a element found in your bathroom that has a mass of 46.31 g and a volume of 6.4409 cm3. Determine the identity of the element.

            **7.190 g/cm3**

58.       Determine the volume in mm3 of a 44.3 g sample of lead.

**3.90 x 103 mm3**

59.       Determine the mass of a 19.3 mm3 sample of lead.

**0.219 g**

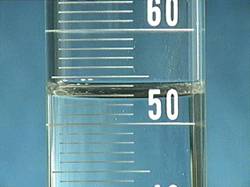
60.       Determine the volume in mm3 of a 6.44 x 10-10 ton sample of copper.

**0.0650 mm3**

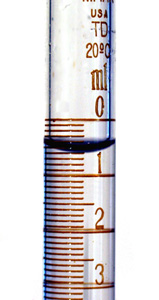
61.       Read the graduated cylinder in mL.           **21.31 mL**

. 

62.       Read the graduated cylinder in mL.           **52.8 mL**



63.       Read the buret in mL.             **0.60 mL**



64.       Read the buret in mL.     **15.45 mL**



65.       Read the buret in mL.             **38.53 mL**

