

Review

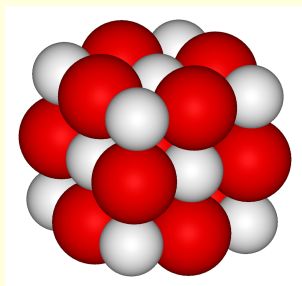
1. What internal factors affect a solid?

External factors?

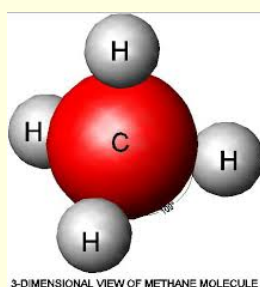
2. Which states of matter have definite volume? Which can flow?

3. Put these in order from lowest to highest melting points.

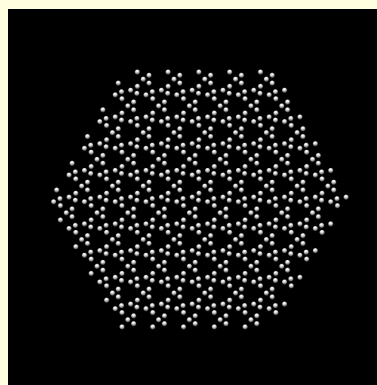
quicklime, CaO



methane, CH₄



quartz, (SiO₂)_x



4. Phase change from gas to solid?

5. Phase change from gas to liquid?

6. What happens to the temperature of the substance when a liquid evaporates?

7. What happens to the temperature of the substance when a solid melts?

8. The average kinetic energy is the least in which phase (state of matter)?

9. What happens to the average kinetic energy of the particles in a sample of matter as the temperature of the sample is decreased?

10. What is the percent composition by mass for each element for (NH₄)₂S?

11. If you have 350g of (NH₄)₂S, how many grams of Sulfur do you have?

review

1. What internal factors affect a solid?

intra and intermolecular bonds

External factors?

temperature and pressure

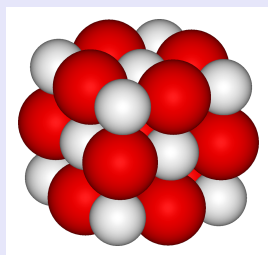
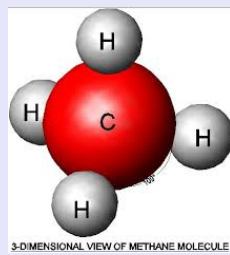
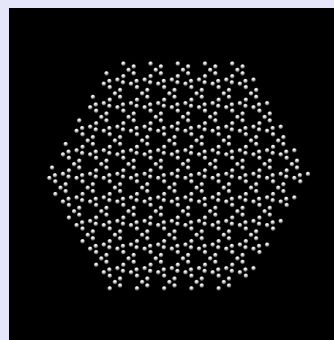
2. Which states of matter have definite volume? Which can flow?

solid, liquid**liquid, gas**

3. Put these in order from lowest to highest melting points.

2

quicklime, CaO

**1**methane, CH₄**3**quartz, (SiO₂)_x4. Phase change from gas to solid? **deposition**5. Phase change from gas to liquid? **condensation**6. What happens to the temperature of the substance when a liquid evaporates? **lose energy, then temperature decrease**7. What happens to the temperature of the substance when a solid melts? **gain energy, then temp increase**8. The average kinetic energy is the least in which phase (state of matter)? **solid**

9. What happens to the average kinetic energy of the particles in a sample of matter as the temperature of the sample is decreased?

ave. KE decreases as temp. decreases10. What is the percent composition by mass for each element for (NH₄)₂S?

$$\text{N } 2 \times 14.0 = 28 \quad 28/68.1 = 41.1\% \text{ N}$$

$$\text{H } 8 \times 1.0 = 8.0 \quad 8/68.1 = 11.7\% \text{ H}$$

$$\text{S } 1 \times 32.1 = \underline{32.1} \quad 32.1/68.1 = 47.1\% \text{ S}$$

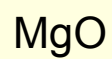
68.1

11. If you have 350g of (NH₄)₂S, how many grams of Sulfur do you have?

$$350\text{g} \times .471 = 165\text{g S}$$

How do you tell what type of bond it is?

What type of bond?



How do you tell what type of bond it is?

2 non-metals --covalent bond
metal, non-metal --ionic bond
only metal -- metallic bond

What type of bond?

H₂O **molecular covalent**

CO₂ **molecular covalent**

Fe **metallic**

NaCl **ionic**

SiC **network covalent**

C **network covalent**

MgO **ionic**

Al **metallic**

SO₂ **molecular covalent**

C **network covalent**

AlPO₄ **ionic**

Draw the structure of 2-hexene.

What is the % mass of C? % mass of H?

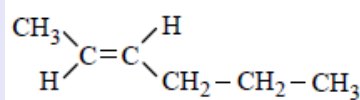
If I have a 132g sample of 2-hexene, how many moles is this?

If I decomposed 132 g 2-hexene to carbon atoms, how many moles of C do I have?

Draw the structure of 2-hexene. Write the formula.



stick structure



structural formula



What is the % mass of C? % mass of H?

$$\begin{array}{r} \text{C } 6 \times 12 = 72 \\ \text{H } 12 \times 1 = 12 \\ \hline 84 \end{array} \quad \begin{array}{l} \frac{72}{84} = 85.7\% \text{ C} \\ \frac{12}{84} = 14.3\% \text{ H} \end{array}$$

If I have a 132g sample of 2-hexene, how many moles is this?

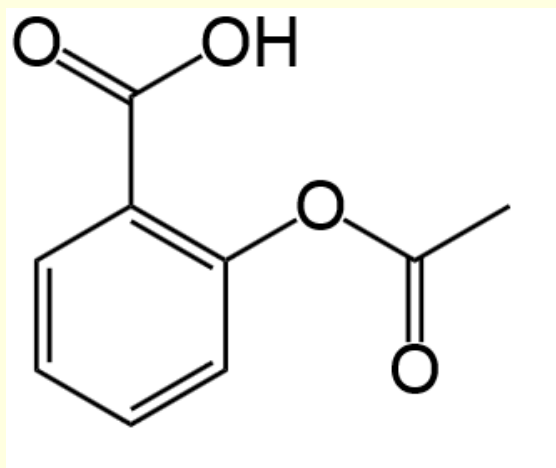
$$\frac{132 \text{ g C}_6\text{H}_{12}}{84 \text{ g C}_6\text{H}_{12}} \times \frac{1 \text{ mol C}_6\text{H}_{12}}{1 \text{ mol C}_6\text{H}_{12}} = 16.5 \text{ mol C}_6\text{H}_{12}$$

If I decomposed 132 g 2-hexene to carbon atoms, how many moles of C do I have?



$$\frac{132 \text{ g C}_6\text{H}_{12}}{84 \text{ g C}_6\text{H}_{12}} \times \frac{1 \text{ mol C}_6\text{H}_{12}}{1 \text{ mol C}_6\text{H}_{12}} \times \frac{6 \text{ mol C}}{6 \text{ mol C}_6\text{H}_{12}} = 9.4 \text{ mol C}$$

Aspirin (acetylsalicylic acid)

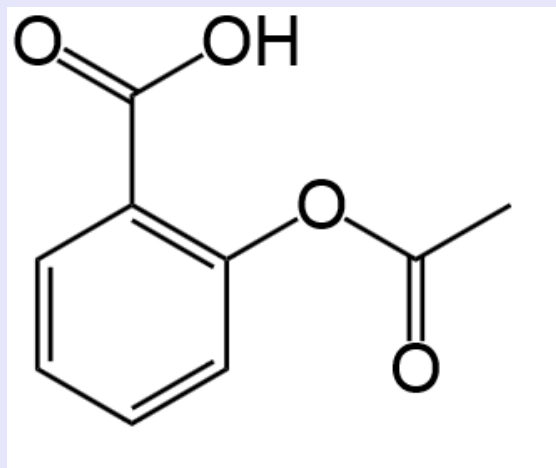


Determine the % mass of each element

There are 325mg of aspirin in a dose.
What mass of carbon is in this dose?

If there is 325 mg of aspirin in a 535 mg capsule, what is the percent mass of aspirin in the sample.

Aspirin (acetylsalicylic acid)



Determine the % mass of each element

$$\text{C } 9 \times 12 = 108 \quad \frac{108}{180} \times 100 = 60\% \text{ C}$$

$$\text{H } 8 \times 1 = 8 \quad \frac{8}{180} \times 100 = 4.4\% \text{ H}$$

$$\text{O } 4 \times 16 = 64 \quad \frac{64}{180} \times 100 = 35.6\% \text{ O}$$

180g/mol

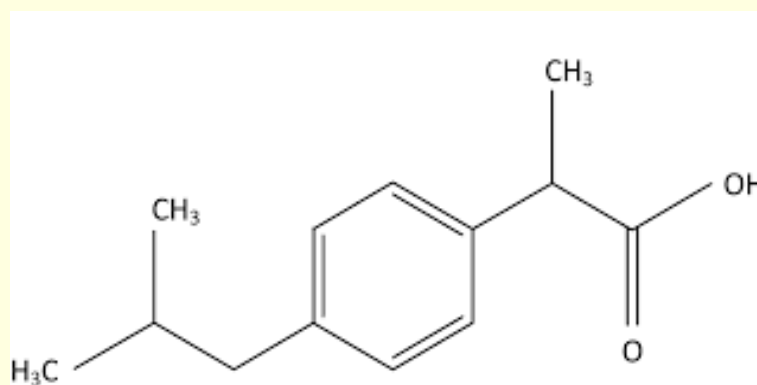
There are 325mg of aspirin in a dose.
What mass of carbon is in this dose?

$$325 \text{ mg C } \times .6 = 195 \text{ mg C}$$

If there is 325 mg of aspirin in a 535 mg capsule, what is the percent mass of aspirin in the sample.

$$\frac{325}{535} \times 100 = 60.7\%$$

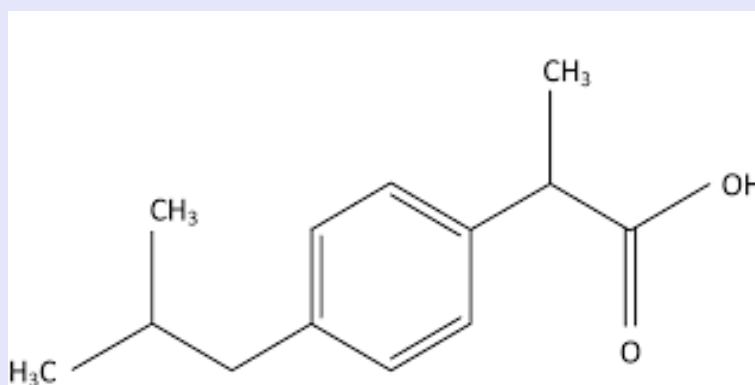
Ibuprofen (Advil)



75.7% C, 8.8%H and 15.5%O
molecular mass: 156 g/mol

Determine the empirical and molecular formula:

Ibuprofen (Advil)



75.7% C, 8.8%H and 15.5%O

molecular mass: 156 g/mol

Determine the empirical and molecular formula:

$$\frac{75.7 \text{ g C}}{12 \text{ g C}} \left| \frac{1 \text{ mole C}}{12 \text{ g C}} \right. = 6.3 \text{ mol C} \quad \frac{6.3}{0.969} = 6.5 \text{ C}$$

$$\frac{8.9 \text{ g H}}{1 \text{ g H}} \left| \frac{1 \text{ mole H}}{1 \text{ g H}} \right. = 8.7 \text{ mol H} \quad \frac{8.7}{0.969} = 9 \text{ H}$$

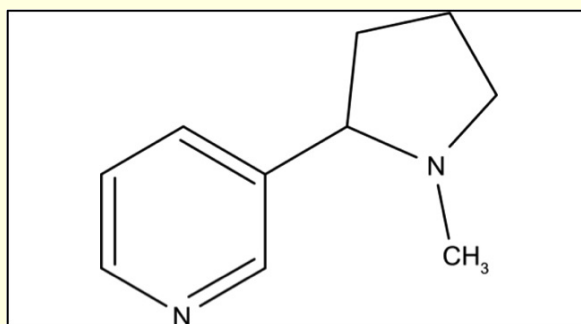
$$\frac{15.5 \text{ g O}}{16 \text{ g O}} \left| \frac{1 \text{ mole O}}{16 \text{ g O}} \right. = 0.969 \text{ mol O} \quad \frac{0.969}{0.969} = 1 \text{ O}$$

multiply by 2 to get whole #



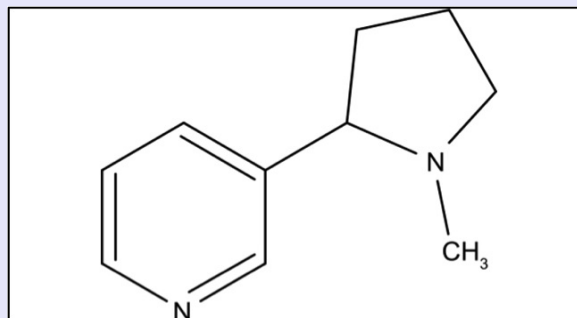
Nicotine has a percent composition of 74.0% C, 8.7 % H and 17.35 % N and has a molar mass of 162 g/mol

Determine the empirical and molecular formulas of nicotine.



Nicotine has a percent composition of 74.0% C, 8.7 % H and 17.35 % N and has a molar mass of 162 g/mol

Determine the empirical and molecular formulas of nicotine.

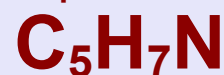


$$\frac{74.0 \text{ g C}}{12.01 \text{ g C}} \left| \frac{1 \text{ mol C}}{12.01 \text{ g C}} \right. = 6.17 \text{ mol C} \quad \frac{6.16}{1.24} = 5$$

$$\frac{8.7 \text{ g. H}}{1 \text{ g H}} \left| \frac{1 \text{ mol H}}{1 \text{ g H}} \right. = 8.7 \text{ mol H} \quad \frac{8.7}{1.24} = 7$$

$$\frac{17.35 \text{ g N}}{14 \text{ g N}} \left| \frac{1 \text{ mol N}}{14 \text{ g N}} \right. = 1.24 \text{ mol N} \quad \frac{1.24}{1.24} = 1$$

empirical formula:



empirical mass:

$$\text{C } 5 \times 12$$

$$\text{H } 7 \times 1$$

$$\text{N } 1 \times 14$$

$$81 \text{ g/mol}$$

$$\frac{162}{81} = 2$$

molecular formula:

