TEST 1 (of 3)

Show all of your work. Students should make use of the conversion factor method throughout and express their answers in scientific notation.

1. (a) Give one example of an element.

   (b) Give one example of a compound.

2. Circle the physical properties below:

   (a) The normal color of elemental bromine is orange.
   (b) Iron turns to rust in the presence of air and water.
   (c) Hydrogen can explode when ignited in air.
   (d) The density of titanium metal is 4.5 g/cm^3.
   (e) Tin metal melts at 505 K.
   (f) Chlorophyll, a plant pigment, is green.

3. Circle the chemical changes below:

   (a) Methane burns in air to produce carbon dioxide and water..
   (b) Water vapor in your exhaled breath condenses in the air on a cold day.
   (c) Plants use carbon dioxide in the air to make sugar.
   (d) Butter melts when placed in the sun.

4. Small iron chips are mixed with sand (see the following photograph).

   (a) Is this a HOMOGENEOUS or HETEROGENEOUS mixture? (circle one word)

   (b) Suggest a way to separate the iron from the sand.

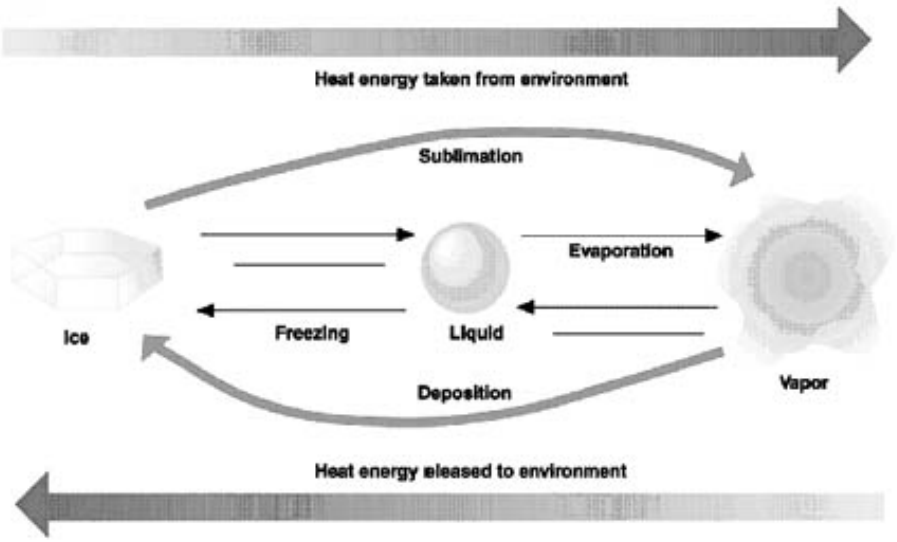
5. (a) 1g = 1000 mg. Write down a conversion factor (CF) ratio for converting milligrams to grams.

   (b)The mass of aspirin in a standard tablet is 325 mg. Use your answer from (a) to calculate this mass in grams.

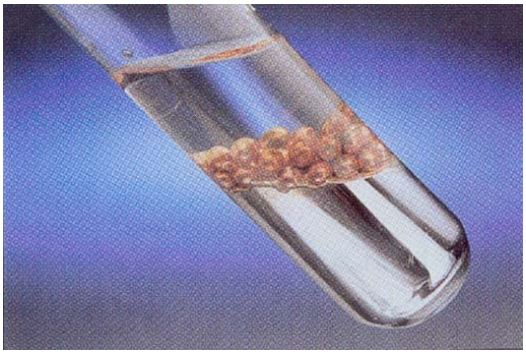
   (c) What is this mass in kilograms?

6. (a) Complete the following phase change diagram for water by filling in the two blank spaces.

(b) Moving left to right across the image involves an EXOTHERMIC ENDOTHERMIC process. (circle one word)



7. The following photo shows copper balls, immersed in water, floating on top of mercury. Label the liquids and solids in this photo. Which substance is most dense? Which is least dense?



8. Diamond has a density of 3.513 g/cm^3. The mass of diamonds is often measured in carats, 1 carat equaling 0.300 g. What is the volume (in cubic centimeters) of a 1.00 carat diamond?

9. Suggest a way to determine if the colorless liquid in the test tube shown above is water (without drinking!). If it is water, does it contain dissolved salt? How could you discover if there was salt dissolved in the water?

10. The coldest ever temperature recorded on the surface of the Earth was – 89 ° C, the warmest ever temperature recorded was 58 °C.

(a) Write down an equation used for converting °C to °F.

(b) Express these temperatures in °F.

BONUS

At 25 ˚C the density of water is 0.997 g/cm^3, whereas the density of ice at -10 ˚C is 0.917 g/cm^3.

(a) If a soft drink can (volume = 250. mL) is filled completely with water and then frozen, what volume does the solid occupy?
(b) Can the ice be contained within the can?