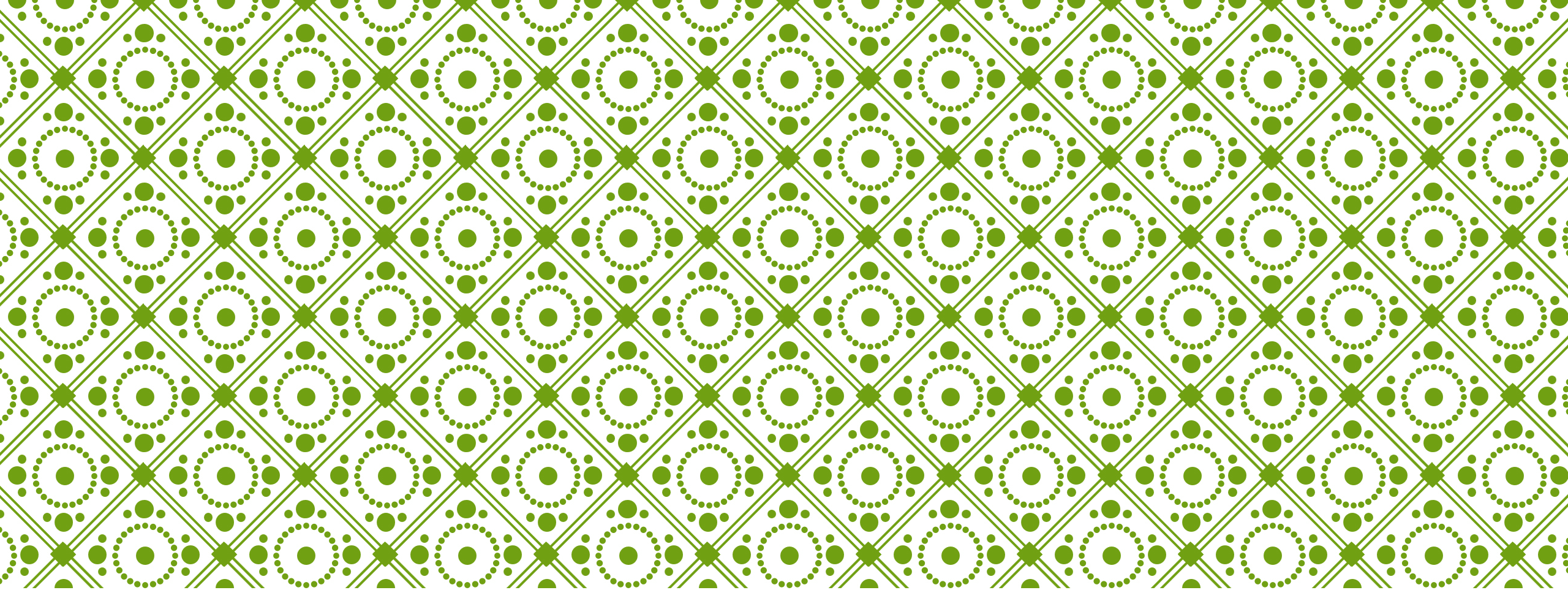


UNIT 3 – ATOMS, ELEMENTS, MOLECULES

L6: Technicolor Atoms

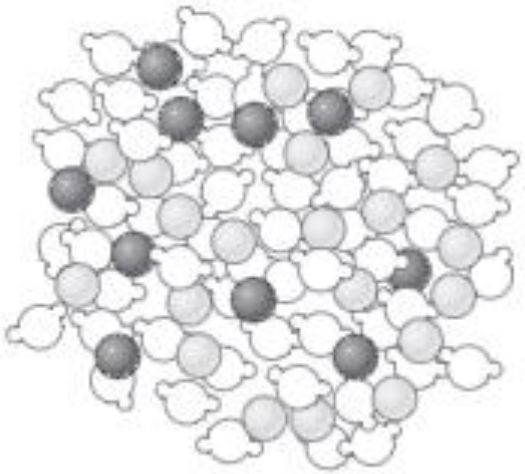
GUIDING QUESTION: USING THE FLAME TEST EXPLAIN HOW TO USE THE RESULTS TO DETERMINE THE IDENTITY OF A COMPOUND.

Do Now:

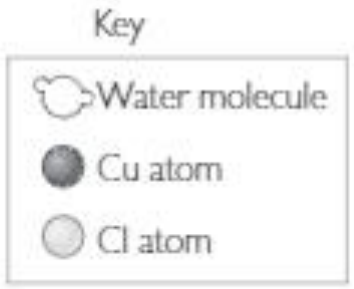
1. Describe each model.
2. What is similar about each model? What is different?

$Cu(s)$
Solid copper

$CuCl_2(s)$
Solid copper (II) chloride



$CuCl_2(aq)$
Aqueous copper (II) chloride



TECHNICOLOR ATOM

Purpose

To provide evidence for the presence of certain atoms within compounds.

Materials

- 1 Bunsen burner
- 1 set of tongs
- 1 piece of copper wire
- 1 penny
- 11 pieces of nichrome wire with a loop
- 1 set of 11 solutions: sodium carbonate, Na_2CO_3; potassium nitrate, KNO_3; copper nitrate, $Cu(NO_3)_2$; strontium nitrate, $Sr(NO_3)_2$; potassium chloride, KCl; sodium chloride, NaCl; copper sulfate, $CuSO_4$; strontium chloride, $SrCl_2$; sodium nitrate, $NaNO_3$; copper chloride, $CuCl_2$; potassium sulfate, K_2SO_4

Safety Instructions

You will be working with flames and chemicals today.

Wear safety goggles.

Roll up long sleeves, tuck in loose clothing, and tie back long hair.

Know the location of the eye wash, fire blanket, and fire extinguisher.

LAB SAFETY:

1. **Goggles MUST be worn at all times.** If I see you without googles on or not covering your eyes, you will immediately receive a 0 on this lab and be given a referral. Your safety is no joking matter!
2. **All backpacks MUST be off the floor and placed on your seat.** This is to prevent tripping hazards while working with chemicals.
3. **Locate the fire extinguisher** and know what to do in case of emergency!
4. When you are done, **ALWAYS turn off your burner immediately and NEVER leave a flame unattended.**
5. **ABSOLUTELY NO CELL PHONES OUT DURING THE LAB!** If your attention is on your cell phone that means it isn't on the large fire in front of you. This is what leads to problems. If I see a cell phone out, you will receive a 0 on this lab and a referral.

PROCEDURE AND OBSERVATIONS:

For ***solutions***, follow these steps:

1. **EACH GROUP HAS THEIR OWN WIRE.**
2. Place the loop end of the wire into a solution. MAKE SURE TO WRITE DOWN WHICH SOLUTION YOU ARE TESTING!
3. Hold the looped end in the flame.
4. Record the color of the flame.
5. Wash the wire off completely with water. Test the next solution.

For the two ***solid*** copper objects:

Use tongs to hold each in the flame and observe the results.

Substance Name	Formula	Flame Color
Sodium Carbonate	Na_2CO_3	
Potassium Nitrate	KNO_3	
Copper Nitrate	$Cu(NO_3)_2$	
Strontium Nitrate	$Sr(NO_3)_2$	
Sodium Nitrate	$NaNO_3$	
Sodium Chloride	$NaCl$	
Potassium Chloride	KCl	
Strontium Chloride	$SrCl_2$	
Copper Chloride	$CuCl_2$	
Copper Sulfate	$CuSO_4$	
Potassium Sulfate	K_2SO_4	
Copper Wire	Cu	
Penny	Cu	

NOTES

The metal element in each chemical formula appears to be responsible for the flame colors.

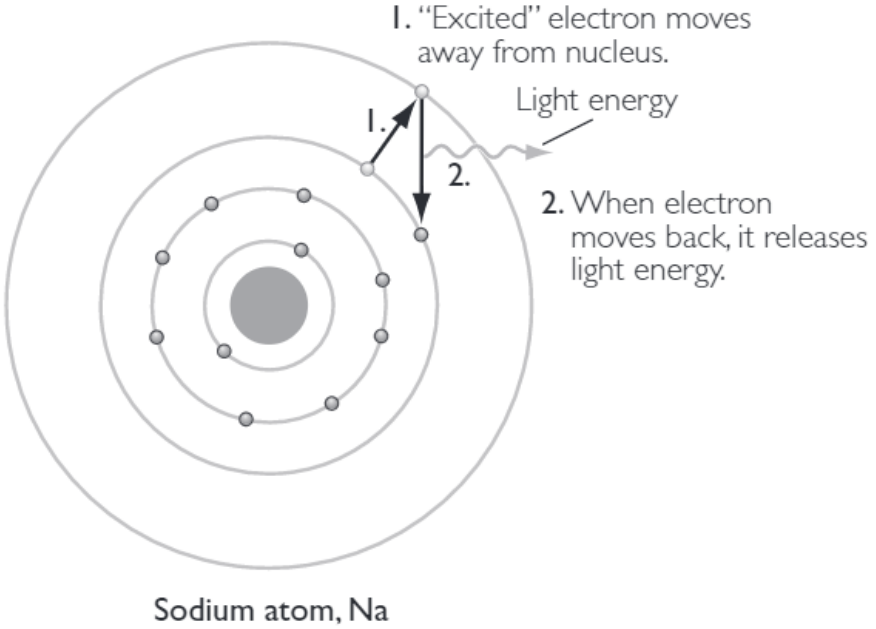
- The nonmetal elements do not give rise to colors when placed in a flame (the compounds with the same metal burn the same color, regardless of the nonmetals they are bonded to).

NOTES

Due to this, we can use flame tests to identify elements

- Flame tests are used in the laboratory to look for the presence of certain metal atoms. The substance is heated in a flame and the resulting color is noted.

NOTES



The illustration to the left indicates that the flame colors are associated with the movement of the electrons within the atom.

The heat from the flame causes the electrons to gain energy and move further away from the nucleus. When the electrons fall back down, they release energy in the form of light.

RESPOND TO GUIDING QUESTION

Using the flame test, explain how to use the results to determine the identity of a compound.

FIREWORKS!

Directions:

1. Turn to page 35 of your notes.
2. Before we begin reading about Fireworks, we will follow steps so that we can gather the most information as possible from the reading.
3. **SURVEY**- Scan the text for 1 minute. What key concepts do you think we will learn? Write down what you think the key concepts are in the first box.
4. **QUESTION**- In your group, generate 3 questions that are likely to be answered by reading the text. Write down these questions together as a group. REMEMEBER– DO NOT START READING THE PAPER.
5. **PREDICT**- Share out-– Whole class prediction.

FIREWORKS!

Directions:

1. **Read** -- Take notes on article ***on the next page*** based on the 3 questions we selected as a class. Record any information that would help us answer our class generated questions.
2. **Respond**--Come up with three questions that this reading brought up for your group.
3. **Summarize**--Summarize the key concepts from the text, using key vocabulary where appropriate

CLOSURE

- NO SCHOOL ON FRIDAY, 11/10

- Homework #10 Due Monday, 11/13

- Achieve 3000: There's Gold in that Ocean Due Friday, 11/10 at 11:59pm