DATE: NAME: CLASS:

CHAPTER 3

Chemical Bonds Concept Map

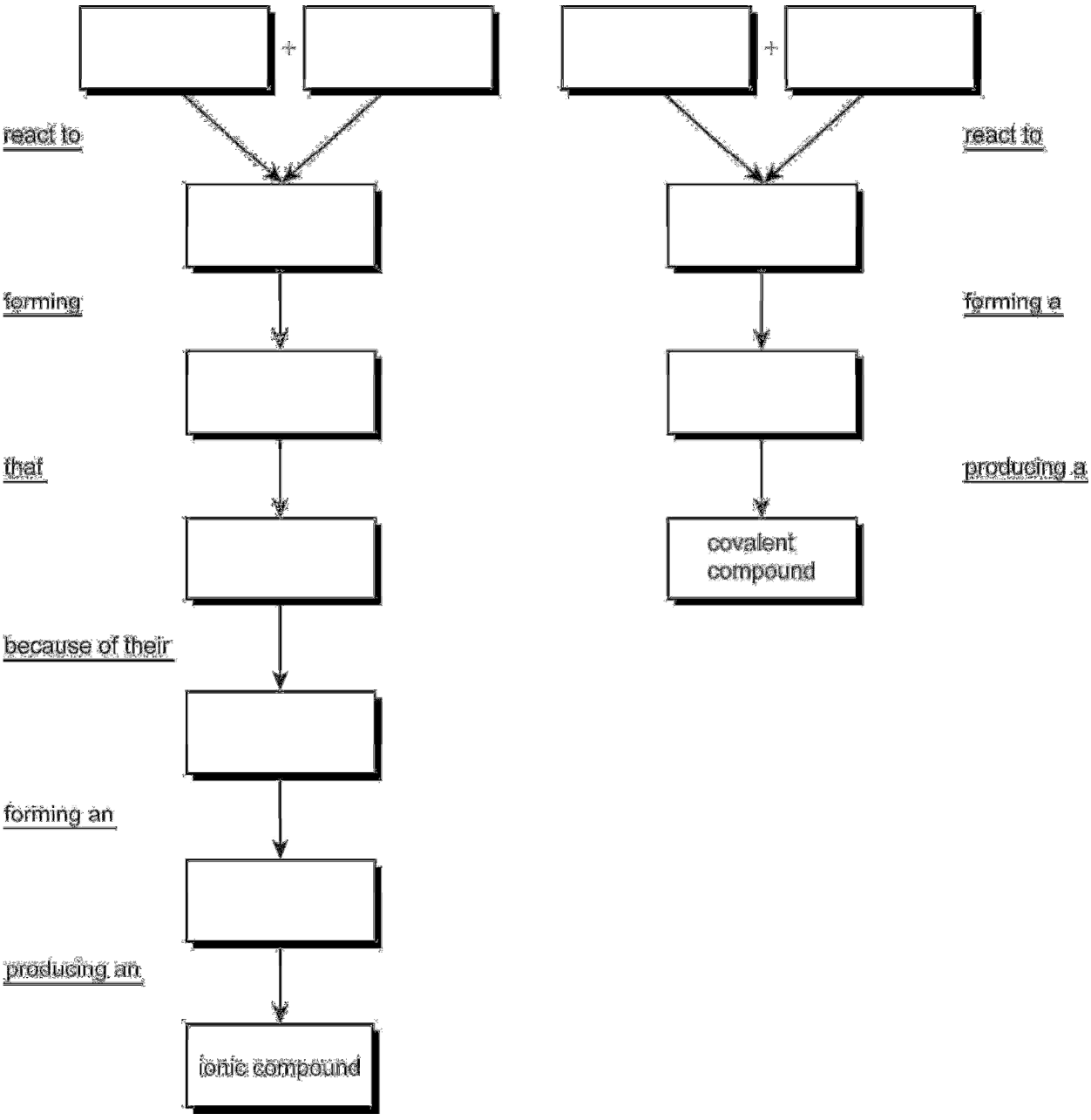
BLM 1-30

Goal • Complete a concept map to demonstrate your knowledge of how atoms form bonds.

What to Do

Use the following words to complete the concept map. You can use each term more than once. You will not need to use every term.

atoms, attract, covalent bond, ionic bond, ions, metal atom, non-metal atom, opposite charges, repel, share electrons, transfer electrons



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BLM 1-13
continued

Goal • Practise your skills and knowledge related to ionic bonding.

Questions

1. Use the words from the list to fill in the blanks in the paragraph below.

   attract, charge, electron, ionic bond, negative, negatively charged, opposite, positive, positively charged, transferred,

   (a) When an atom gains or loses a(n) _____, an ion is formed. All ions have a(n) _____.

   (b) Metals tend to form _____ ions. Non-metals tend to form _____ ions.

   (c) When a metal atom reacts with a non-metal atom, one or more electrons are _____, which results in the formation of ions. One of these ions will be _____ and one will be _____. Because of these _____ charges, the ions _____ each other, forming a(n) _____.

2. (a) Draw a model Bohr diagram for lithium in the space provided.

   (b) What process or change would turn this lithium atom into an ion?

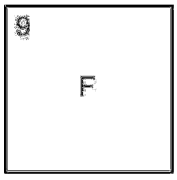
   _____

   (c) Would the ion that it forms be positively or negatively charged? Explain.

   _____

   _____

3. (a) Draw a Bohr model diagram for fluorine in the space provided.



   (b) What process or change would turn this fluorine atom into an ion?

   _____

   (c) Would this ion be positively charged or negatively charged? Explain.

   _____

   _____

4. Lithium and fluorine react to form lithium fluoride. Draw a diagram on the back of this page to show how these two atoms would react.

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continued

Goal • Demonstrate your knowledge of ionic bonding.

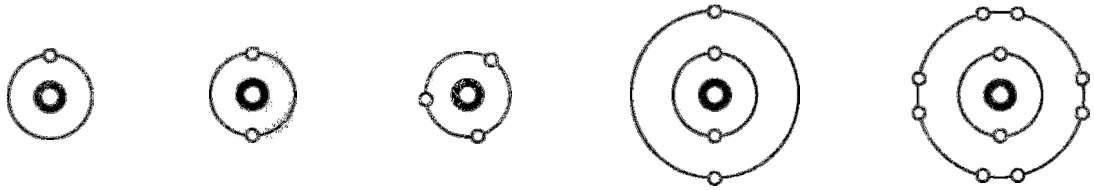
What to Do

Show your knowledge of ionic bonding by answering the following questions in the spaces provided.

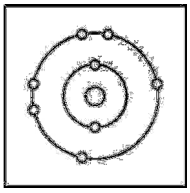
Questions

1. Examine the Bohr model diagrams below. Circle the atoms that are stable.

(a) (b) (c) (d) (e)



2. The following Bohr model diagram represents an oxygen atom. Examine the diagram, then answer the following questions.



(a) Why is this not a stable electron arrangement?

_____

(b) What would make this atom stable?

_____

(c) Use a coloured pencil to adjust the diagram so that it shows a stable electron arrangement.

(d) Label the charge on this newly formed ion.

3. Draw a Bohr model diagram to show how an ionic bond would form between sodium (Na) and chlorine (Cl).

4. Define the term “ionic bond.”

_____

_____

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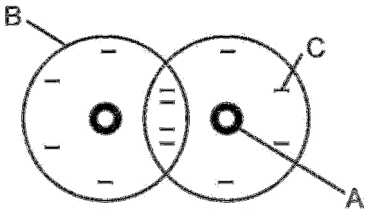
continued

Goal • Practice drawing bonding diagrams for covalent compounds.

What to Do

The drawing at right represents a covalent compound. Study this diagram then answer the following questions.



In an O_2 molecule, two pairs of electrons are shared.

Analyze

1. What does the small circle (A) represent?
   _____
2. What does the larger circle (B) represent?
   _____
3. What does the dash (C) represent?
   _____
4. The large circles overlap. What does this represent?
   _____
   _____
5. Why are there four dashes inside the overlapped area?
   _____
6. How many electrons are in the outer shell of the oxygen atom on the left?_____
7. How many electrons are in the oxygen atom on the right?
   _____
8. Explain how a covalent bond differs from an ionic bond.
   _____
   _____
9. Draw diagrams to show how each of the covalent compounds below is formed by covalent bonding.

HCl	FCl
OF_2	NH_3