

# **CHEMISTRY A AND CHEMISTRY B (SALTERS)**

## **Student Activity**

### **Checkpoint Task: Bonding and structure**

#### ***Student Activity***

##### **Introduction**

In your study of Bonding and Structure at A Level, you will be building a lot on ideas that you have already covered previously. Because bonding is a complex subject that is often simplified at GCSE, many learners can have unclear ideas or misconceptions about the topic. This activity will encourage you to explore what you already understand about chemical bonding, and to identify those areas that you still struggle with or require refinement at A Level.

##### **Task 1**

Here are twenty statements about chemical bonding. Think carefully about each statement and then decide whether the statement is always true (unbreakable rule) or usually true (rule of thumb).

Either cut out and separate the statements into two piles – always true or usually true or mark each one AT or UT (you could use two colours).

##### **Task 2**

For the statements that you think are not always true, try to think up some exceptions to the rule. You could use an equation or example element or compound to illustrate the 'exception to the rule'. Feel free to consult textbooks or other resources to help you with this.











##### **Task 3**

Check your ideas using the accompanying answer sheet.










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## Student Activity

### Statements for use in activity

<p>A. The atoms of Group 2 elements have two electrons in their outer shell.</p> 	<p>B. Noble gases do not form any types of bonds because they have full outer shells.</p> 
<p>C. Ionic substances have higher melting points than covalent substances.</p> 	<p>D. Oppositely charged ions attract.</p> 
<p>E. Delocalised electrons are more stable than electrons in fixed atomic orbitals.</p> 	<p>F. Energy is released when ionic bonds form.</p> 
<p>G. In an ionic compound, ions are combined in proportions which balance out the electrical charges.</p> 	<p>H. Energy is needed to break covalent bonds.</p> 
<p>I. Energy is required to form positive ions from atoms.</p> 	<p>J. Energy is released when negative ions are formed from atoms.</p> 

## Statements for use in activity

<p><b>K. Bonding within compounds is either ionic or covalent.</b></p> 	<p><b>L. Electrons shared between atoms (in molecular orbitals) are more stable than electrons in atomic orbitals.</b></p> 
<p><b>M. Electrons that are closer to the nucleus experience less shielding and are more strongly attracted than electrons further away.</b></p> 	<p><b>N. A covalent bond is formed from a shared pair of electrons; one electron comes from each atom within the bond.</b></p> 
<p><b>O. Compounds are more stable than elements.</b></p> 	<p><b>P. Elements always react to form ions with noble gas electron configurations.</b></p> 
<p><b>Q. Ionic compounds are formed when metals react with non-metals.</b></p> 	<p><b>R. Covalent compounds are formed when non-metals react with other non-metals.</b></p> 
<p><b>S. Hydrogen atoms form ions by losing one electron and becoming H<sup>+</sup>.</b></p> 	<p><b>T. Within a covalent compound, all elements except hydrogen have eight electrons in their outer shells.</b></p> 