
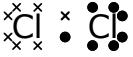
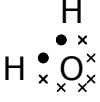
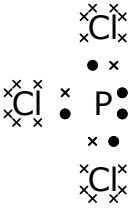

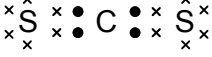

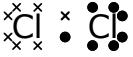
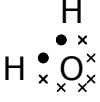
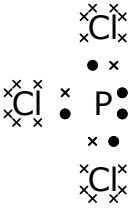

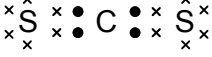

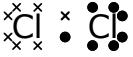
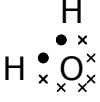
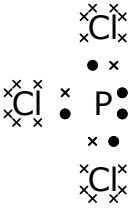

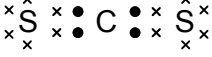


**Assessment Schedule – 2006****Chemistry: Describe atomic structure and bonding (90172)****Evidence Statement**

Question	Evidence	Achievement	Merit	Excellence														
1	(a) K (b) 2 8 8 1 (c) 12 (d) same number of electrons in their outer shell/ energy level. (e) 2 8	<b>FOUR</b> correct answers.																
2	<table border="1"> <thead> <tr> <th rowspan="2">Isotope</th> <th colspan="2">Number of particles present in the nucleus</th> </tr> <tr> <th>protons</th> <th>neutrons</th> </tr> </thead> <tbody> <tr> <td><sup>16</sup>O</td> <td><b>8</b></td> <td><b>8</b></td> </tr> <tr> <td><sup>17</sup>O</td> <td><b>8</b></td> <td><b>9</b></td> </tr> <tr> <td><sup>18</sup>O</td> <td><b>8</b></td> <td><b>10</b></td> </tr> </tbody> </table>	Isotope	Number of particles present in the nucleus		protons	neutrons	<sup>16</sup> O	<b>8</b>	<b>8</b>	<sup>17</sup> O	<b>8</b>	<b>9</b>	<sup>18</sup> O	<b>8</b>	<b>10</b>	<b>ALL</b> correct.		
Isotope	Number of particles present in the nucleus																	
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<sup>17</sup> O	<b>8</b>	<b>9</b>																
<sup>18</sup> O	<b>8</b>	<b>10</b>																
3	(a) O is the exception.  (b) Because the other three are in Group 2 of the periodic table and have 2 electrons in their outer shell. O is in Group 16 and has 6 electrons in its outer shell.	Identifies O and relates to either the periodic table <b>OR</b> The electron arrangement or evidence of electron arrangement <b>OR</b> Electron arrangement and group on periodic table for either O or group 2 metals.	Identifies O <b>AND</b> makes a full explanation.															

4	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 50%; padding: 5px;">           (a) Nitrogen atom, N   </td> <td style="width: 50%; padding: 5px;">           (b) Chlorine molecule, Cl<sub>2</sub>   </td> </tr> <tr> <td style="padding: 5px;">           (c) Water, H<sub>2</sub>O   </td> <td style="padding: 5px;">           (d) Phosphorus trichloride, PCl<sub>3</sub>   </td> </tr> <tr> <td style="padding: 5px;">           (e) Nitrogen molecule, N<sub>2</sub>   </td> <td style="padding: 5px;">           (f) Carbon disulfide, CS<sub>2</sub>   </td> </tr> </tbody> </table>	(a) Nitrogen atom, N 	(b) Chlorine molecule, Cl <sub>2</sub> 	(c) Water, H <sub>2</sub> O 	(d) Phosphorus trichloride, PCl <sub>3</sub> 	(e) Nitrogen molecule, N <sub>2</sub> 	(f) Carbon disulfide, CS <sub>2</sub> 	<p><b>THREE</b> out of six correct.</p> <p>Answers must show correct pairing of electrons.</p>	<p><b>FOUR</b> out of six correct including <b>ONE</b> of (e) or (f).</p>	
(a) Nitrogen atom, N 	(b) Chlorine molecule, Cl <sub>2</sub> 									
(c) Water, H <sub>2</sub> O 	(d) Phosphorus trichloride, PCl <sub>3</sub> 									
(e) Nitrogen molecule, N <sub>2</sub> 	(f) Carbon disulfide, CS <sub>2</sub> 									
5	<p>NaCl is an ionic solid held together by strong attractive forces between the ions. In the solid state in NaCl, these ions are fixed in place and not free to move. But in the liquid state, the ions become mobile as attractive forces are broken and the ions can carry a charge.</p> <p>SCl<sub>2</sub> is a covalent or molecule and in both the solid and liquid state, there are no ions or free electrons to carry the charge, only molecules.</p>	<p>NaCl ionic <b>AND</b> has charged particles/ions (electrons negates)  <b>OR</b>        SCl<sub>2</sub> covalent/molecular <b>AND</b> has no charge  <b>OR</b>        NaCl is ionic and SCl<sub>2</sub> is covalent/molecular.</p>	<p><b>TWO</b> of the following three ideas:</p> <ul style="list-style-type: none"> <li>• liquid NaCl has mobile ions</li> <li>• solid NaCl has no mobile ions</li> <li>• SCl<sub>2</sub> has no mobile charged particles in either state.</li> </ul>	<p>The following <b>THREE</b> ideas are needed.</p> <ul style="list-style-type: none"> <li>• liquid NaCl has mobile ions</li> <li>• solid NaCl has no mobile ions</li> <li>• SCl<sub>2</sub> has no mobile charged particles in either state.</li> </ul>						
6(a)	<p>Cl<sub>2</sub> is a molecule or molecular solid or covalently bonded molecule.</p> <p>Therefore it only has weak attractive forces or intermolecular forces or Van der Waals between particles or molecules.</p> <p>Less energy is needed, or sufficient energy at room temperature, to overcome forces and separate molecules or particles into the gas state where they are able to move freely or rapidly or randomly.</p>	<p>Correctly identifies Cl<sub>2</sub> as a gas made up of covalently bonded molecules.</p>	<p>Correctly links type of compound to <b>ONE</b> of:</p> <ul style="list-style-type: none"> <li>• particle separation</li> <li>• energy</li> <li>• particle motion</li> </ul> <p><b>AND</b> the weak attractive forces between molecules or particles</p>	<p>Shows a clear understanding and correctly links type of compound to all of:</p> <ul style="list-style-type: none"> <li>• particle separation</li> <li>• energy</li> <li>• particle motion</li> </ul> <p><b>AND</b> the weak attractive forces between the molecules.</p>						

6(b)	<p>KCl contains ionic bonds or ions made up of strong ionic bonds / or attractive forces or electrostatic forces between ions or particles.</p> <p>A large amount of energy or not enough energy at room temperature to overcome forces and separate the ions or particles.</p> <p>So the particles or ions cannot move easily or vibrate so this is a solid.</p>	Correctly identifies KCl as a solid with ionic bonds between ions.	<p>Correctly links type of compound to <b>ONE</b> of:</p> <ul style="list-style-type: none"> <li>• particle separation</li> <li>• energy</li> <li>• particle motion</li> </ul> <p><b>AND</b> the strong attractive forces between ions or particles.</p>	<p>Shows a clear understanding and correctly links type of compound to all of:</p> <ul style="list-style-type: none"> <li>• particle separation</li> <li>• energy</li> <li>• particle motion</li> </ul> <p><b>AND</b> the strong attractive forces between the ions.</p>
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### Judgement Statement

#### Chemistry: Describe atomic structure and bonding (90172)

Achievement	Achievement with Merit	Achievement with Excellence
<p>FIVE questions answered correctly</p> <p>Minimum of <math>5 \times A</math></p>	<p>SIX questions answered correctly, including at least THREE at Merit level.</p> <p>Minimum of <math>3 \times M + 3 \times A</math></p>	<p>SIX questions answered correctly, including at least TWO at Merit level and at least TWO at Excellence level.</p> <p>Minimum of <math>2 \times E + 2 \times M + 2 \times A</math></p>