

Year 12 Chemistry
Elemental Chemistry
Practice Test

1. Sulfur forms a number of different molecules, one of which is sulfur trioxide SO_3 .
 - (a) Write the electron configuration of sulfur, using subshell notation. /2
 - (b) Draw a diagram showing the bonding and shape of a molecule of sulfur trioxide. /2
 - (c) On the diagram for part (b), show the polarity of one bond. /1
 - (d) State why sulfur trioxide is non-polar even though its bonds are polar. /1
 - (e) State the oxidation state of sulfur in sulfur trioxide. /1
 - (f) State two other likely positive oxidation states of sulfur in its compounds /2
 - (g) Explain, with reference to subshells, why these three different positive oxidation states are possible for sulfur. /2
 - (h) Sulfur may also have a negative oxidation state, when it bonds ionically.
Write the electron configuration of the sulfide ion, using subshell notation. /2
 - (i) Sulfur trioxide reacts with water. Write an equation to show this reaction. /2

2. Water and silicon dioxide both contain only non-metal atoms.
 - (a) Draw the structural formula of water. /2
 - (b) Name the shape of the water molecule. /1
 - (c) Explain why water is a liquid at room temperature and silicon dioxide is a solid. /3
 - (d) Write a reaction showing how silicon dioxide displays acidic nature. /2
 - (e) State whether the electronegativity of silicon is high, intermediate, or low. /1

3. Chromium oxide reacts with hydrogen ions.
 - (a) Write an equation to show this reaction. /2
 - (b) State the nature chromium oxide is displaying by reacting with hydrogen ions. /1
 - (c) State the nature of the element chromium. /1
 - (d) Write the electron configuration for chromium, using subshell notation. /2
 - (e) Write the electron configuration for the chromium ion, using subshell notation. /2
 - (f) Identify the block of the periodic table in which chromium is found. /1

TOTAL /33