

Worksheet 1

1 Chemical bonding and Lewis structures

- 1.1 Which of the following pairs of atoms have the same number of valence electrons?
- A H and He
 - B H and F
 - C Cl and F
 - D Cl and H
- 1.2 Which of the following pairs of atoms are most likely to make the same number of bonds?
- A He and Ne
 - B H and O
 - C Cl and C
 - D Cl and H
- 1.3 A double covalent bond forms when ...
- A two different atoms share two electron pairs.
 - B two different atoms share two electrons.
 - C one atom transfers two electron pairs to another atom.
 - D one atom supplies two electrons for a bond with another atom.
- 1.4 Use Lewis diagrams to represent the following molecules:
- 1.4.1 N_2
 - 1.4.2 HOCl
 - 1.4.3 NF_3
 - 1.4.4 H_2S
- 1.5 A hydronium ion (H_3O^+) is formed when a hydrogen ion bonds with a water molecule.
- 1.5.1 Draw the Lewis structure for a water molecule.
 - 1.5.2 Name the type of bond that is formed between the water molecule and the hydrogen ion.
 - 1.5.3 Use Lewis structures to show clearly how the hydronium ion is formed.

2 Molecular shape and polarity

- 2.1 Which one of the following molecules has a linear shape?
- A H_2O
 - B CO_2
 - C BF_3
 - D OF_2
- 2.2 What type of bond is found in the N_2O molecule?
- A Non-polar covalent
 - B Weakly polar covalent
 - C Strongly polar covalent
 - D Ionic