

### Assessment

#### Atomic theory and bonding

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1. C 2. A 3. B 4. E 5. D 6. B 7. D 8. D 9. D 10. A 11. B  
12. B 13. A 14. A 15. C 16. B

## Section 4.2 Names and Formulas of Compounds

### Comprehension

#### Multivalent metals and polyatomic ions

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1. (a) a compound made up of a metal and a non-metal  
(b) a metal that has more than one ion charge  
(c) an ion composed of more than one type of atom joined by covalent bonds
- 2.

	Positive ion	Negative ion	Formula	Compound name
(a)	Pb <sup>2+</sup>	O <sup>2-</sup>	PbO	lead(II) oxide
(b)	Sb <sup>4+</sup>	S <sup>2-</sup>	SbS <sub>2</sub>	antimony(IV) sulphide
(c)	Tl <sup>+</sup>	Cl <sup>-</sup>	TlCl	thallium(I) chloride
(d)	Sn <sup>2+</sup>	F <sup>-</sup>	SnF <sub>2</sub>	tin(II) fluoride
(e)	Mo <sup>3+</sup>	S <sup>2-</sup>	Mo <sub>2</sub> S <sub>3</sub>	molybdenum(III) sulphide
(f)	Rh <sup>4+</sup>	Br <sup>-</sup>	RhBr <sub>4</sub>	rhodium(IV) bromide
(g)	Cu <sup>+</sup>	Te <sup>2-</sup>	Cu <sub>2</sub> Te	copper(I) telluride
(h)	Nb <sup>5+</sup>	I <sup>-</sup>	NbI <sub>5</sub>	niobium(V) iodide
(i)	Pd <sup>2+</sup>	Cl <sup>-</sup>	PdCl <sub>2</sub>	palladium(II) chloride

3. (a) MnCl<sub>2</sub>  
(b) Cr<sub>2</sub>S<sub>3</sub>  
(c) TiO<sub>2</sub>  
(d) UF<sub>6</sub>  
(e) NiS  
(f) V<sub>2</sub>O<sub>5</sub>  
(g) Re<sub>3</sub>Ar<sub>7</sub>  
(h) Pt<sub>3</sub>N<sub>4</sub>  
(i) NiCN<sub>2</sub>  
(j) Bi<sub>3</sub>P<sub>5</sub>

4.

	Ions	Formula	Compound name
(a)	K <sup>+</sup> NO <sub>3</sub> <sup>-</sup>	KNO <sub>3</sub>	potassium nitrate
(b)	Ca <sup>2+</sup> CO <sub>3</sub> <sup>2-</sup>	CaCO <sub>3</sub>	calcium carbonate
(c)	Li <sup>+</sup> HSO <sub>4</sub> <sup>-</sup>	LiHSO <sub>4</sub>	lithium bisulphate or lithium hydrogen sulphate
(d)	Mg <sup>2+</sup> SO <sub>3</sub> <sup>2-</sup>	MgSO <sub>3</sub>	magnesium sulphite
(e)	Sr <sup>2+</sup> CH <sub>3</sub> COO <sup>-</sup>	Sr(CH <sub>3</sub> COO) <sub>2</sub>	strontium acetate
(f)	NH <sub>4</sub> <sup>+</sup> Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>	(NH <sub>4</sub> ) <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	ammonium dichromate
(g)	Na <sup>+</sup> MnO <sub>4</sub> <sup>-</sup>	NaMnO <sub>4</sub>	sodium permanganate
(h)	Ag <sup>+</sup> ClO <sub>3</sub> <sup>-</sup>	AgClO	silver hypochlorite
(i)	Cs <sup>+</sup> OH <sup>-</sup>	CsOH	cesium hydroxide
(j)	Ba <sup>2+</sup> CrO <sub>4</sub> <sup>2-</sup>	BaCrO <sub>4</sub>	barium chromate

5. (a) Ba(HSO<sub>4</sub>)<sub>2</sub>  
(b) NaClO<sub>3</sub>  
(c) K<sub>2</sub>CrO<sub>4</sub>  
(d) Ca(CN)<sub>2</sub>  
(e) KOH  
(f) Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>  
(g) Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>  
(h) CdCO<sub>3</sub>  
(i) AgNO<sub>2</sub>  
(j) NH<sub>4</sub>HCO<sub>3</sub>

### Comprehension

#### Chemical names and formulas of ionic compounds

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1. (a) beryllium sulphide  
(b) mercury(II) nitride  
(c) copper(II) nitrate  
(d) silver oxide  
(e) cobalt(II) bromide  
(f) bismuth(V) phosphate  
(g) calcium fluoride

- (h) manganese(III) oxide
- (i) chromium(III) sulphate
- (j) zinc chloride
- (k) nickel(II) hydroxide
- (l) potassium dichromate
- (m) scandium fluoride
- (n) sodium iodide
- (o) lead(II) carbonate
- (p) rubidium chlorite
- (q) potassium phosphide
- (r) magnesium cyanide
- (s) tin(II) sulphide
- (t) sodium bicarbonate or sodium hydrogen carbonate

2. (a)  $\text{AlBr}_3$   
 (b) PtS  
 (c)  $\text{SrSO}_3$   
 (d)  $\text{Sc}_2\text{O}_3$   
 (e)  $\text{Ti}(\text{NO}_2)_4$   
 (f)  $(\text{NH}_4)_2\text{SO}_4$   
 (g)  $\text{Li}_2\text{Se}$   
 (h)  $\text{Pb}(\text{HSO}_4)_2$   
 (i)  $\text{NaCH}_3\text{COO}$   
 (j) CsCl  
 (k)  $\text{Cd}(\text{OH})_2$   
 (l)  $\text{Zn}_3(\text{PO}_4)_2$   
 (m)  $\text{BaCl}_2$   
 (n)  $\text{Sn}(\text{MnO}_4)_2$   
 (o) LiClO  
 (p)  $\text{Au}_2(\text{SO}_4)_3$   
 (q)  $\text{NaNO}_3$   
 (r)  $\text{CrCl}_3$   
 (s)  $\text{K}_2\text{CO}_3$   
 (t)  $\text{Fe}(\text{HSO}_4)_3$

### Comprehension

#### Chemical names and formulas of covalent compounds

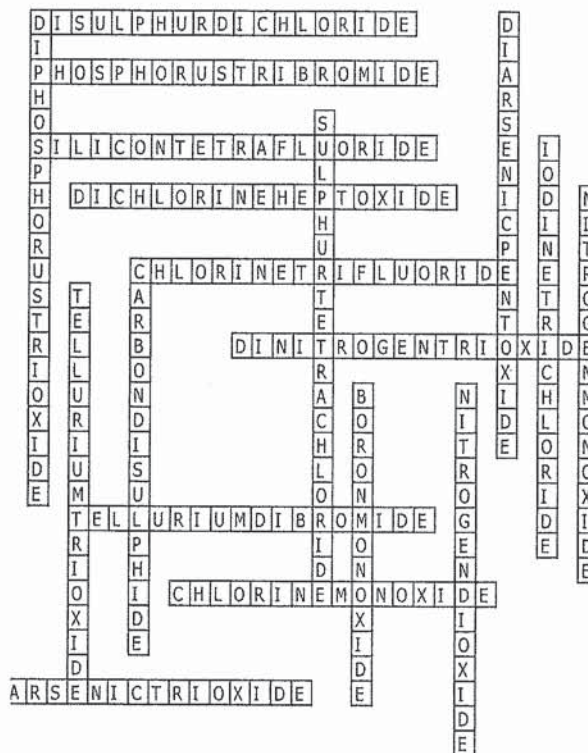
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1. a compound consisting of two non-metals; a compound that involves the sharing of electrons
2. covalent bond
3. prefixes: mono, di, tri, tetra, penta, hexa, hepta, octa, nona, deca
4. (a)  $\text{SiO}_2$   
 (b)  $\text{ClO}_2$   
 (c)  $\text{TeO}_2$   
 (d)  $\text{SeO}_3$

- (e)  $\text{CS}_2$
- (f)  $\text{AsCl}_3$
- (g)  $\text{ClO}_7$
- (h)  $\text{SeF}_2$
- (i)  $\text{N}_2\text{O}_5$
- (j)  $\text{N}_2\text{O}$
- (k)  $\text{AsBr}_4$
- (l)  $\text{AsCl}_5$
- (m)  $\text{S}_2\text{O}_5$
- (n) SCl
- (o)  $\text{PCl}_3$
- (p)  $\text{P}_2\text{O}_5$

5.

#### COVALENT COMPOUNDS



#### Word List

Arsoenic trioxide  
 Boron monoxide  
 Carbon disulphide  
 Chlorine monoxide  
 Diarsenic pentoxide  
 Dichlorine heptoxide  
 Dinitrogen trioxide  
 Disulphur dichloride  
 Iodine trichloride  
 Nitrogen dioxide  
 Nitrogen monoxide  
 Phosphorus tribromide  
 Silicon tetrafluoride  
 Sulphur tetrachloride  
 Tellurium dibromide  
 Tellurium trioxide

#### ACROSS

1.  $\text{S}_2\text{Cl}_2$
3.  $\text{PBr}_3$
5.  $\text{SiF}_4$
7.  $\text{Cl}_2\text{O}_7$
9.  $\text{ClF}_3$
11.  $\text{N}_2\text{O}_3$
14.  $\text{TeBr}_2$
15. ClO
16.  $\text{AsO}_3$

#### DOWN

1.  $\text{P}_2\text{O}_3$
2.  $\text{As}_2\text{O}_5$
4.  $\text{SCl}_4$
6.  $\text{ICl}_3$
8. NO
9.  $\text{CS}_2$
10.  $\text{TeO}_3$
12. BO
13.  $\text{NO}_2$