

Science 10 Review

1. Define the following terms:

- | | |
|---------------------|----------------------------------|
| a) proton | i) multivalent |
| b) neutron | j) endothermic |
| c) electron | k) exothermic |
| d) atom | l) law of conservation of matter |
| e) ion | m) mole |
| f) valence electron | n) molar mass |
| g) octet rule | o) mass number |
| h) monovalent | p) isotope |

2. Draw the energy level diagrams for the following:

- | | |
|------------------|------------------|
| a) fluorine atom | d) nitride ion |
| b) carbon atom | e) argon atom |
| c) lithium ion | f) magnesium ion |

3. Where on the periodic table would you find nonmetals? What kind of charge do all nonmetals have?

right hand side of staircase.

4. Where on the periodic table would you find metals? What kind of charge do all metals have?

left of staircase → positive

5. Perform the following unit conversions:

- | | |
|--|---|
| a) 500 kg = $\frac{5.00 \times 10^5}{1000}$ g | e) 600 mg = $\frac{0.600}{1000}$ g |
| b) 25.5 mL = $\frac{2.55 \times 10^{-2}}{1000}$ L | f) 9.85 GL = $\frac{9.85 \times 10^9}{1000}$ L |
| c) 102.6 mmol = $\frac{1.026 \times 10^5}{1000}$ mol | g) 6.85 cm = $\frac{0.0685 \text{ or } 6.85 \times 10^{-2}}{100}$ m |
| d) 58.2 MJ = $\frac{5.82 \times 10^7}{1000000}$ J | h) 680 nm = $\frac{6.80 \times 10^{-7}}{1000000000}$ m |

6. Calculate the number of moles in 6.55 g of $\text{NaHCO}_3(\text{s})$.

$$M = 84.01 \text{ g/mol}$$

$$m = 6.55 \text{ g}$$

$$n = ?$$

$$n = \frac{m}{M}$$

$$n = \frac{6.55 \text{ g}}{84.01 \text{ g/mol}}$$

$$n = 0.077966 \dots$$

$$n = 0.0780 \text{ mol}$$

7. Calculate the mass of 8.98 mol of $\text{AgNO}_3(\text{s})$.

$$M = 169.88 \text{ g/mol}$$

$$n = 8.98 \text{ mol}$$

$$m = nM$$

$$m = 8.98 \text{ mol} \cdot 169.88 \text{ g/mol}$$

$$m = 1525.52 \text{ g}$$

$$m = 1.53 \times 10^3 \text{ g}$$

8. What is the mass of 0.155 mol of potassium phosphate?



$$M = 212.27 \text{ g/mol}$$

$$n = 0.155 \text{ mol}$$

$$m = ?$$

$$m = nM$$

$$m = 0.155 \text{ mol} \cdot 212.27 \text{ g/mol}$$

$$m = 32.901 \text{ g}$$

$$m = 32.9 \text{ g}$$

9. How many moles are in 0.558 kg of dinitrogen dioxide?



$$m = 0.558 \text{ kg}$$

$$m = 558 \text{ g}$$

$$M = 60.02 \text{ g/mol}$$

$$n = ?$$

$$n = \frac{m}{M}$$

$$n = \frac{558 \text{ g}}{60.02 \text{ g/mol}}$$

$$n = 9.2969 \text{ mol}$$

$$n = 9.30 \text{ mol}$$

I = name
E = element A = acid

10. Complete the following chart:

	Class	Formula	IUPAC Name
1.	I	SrCl ₂	strontium chloride
2.	A	H ₂ S _(aq)	hydrosulfuric acid
3.	I	Na ₂ O	sodium oxide
4.	M	H ₂ O	water.
5.	I	CaS ₂ O ₃ • 7H ₂ O	calcium thiosulfate heptahydrate
6.	I	Fe(IO ₃) ₃	iron (III) iodate
7.	M	P ₂ O ₄	diphosphorus tetraoxide
8.	E	S _{8(s)}	solid sulfur.
9.	I	Ni(OH) ₂	nickel (II) hydroxide
10.	A	H ₃ PO _{4(aq)}	phosphoric acid
11.	I	NaCl	sodium chloride
12.	E	N _{2(g)}	nitrogen gas
13.	I	Sb ₂ (SO ₃) ₅	antimony (V) sulfite
14.	E	Ca _(s)	calcium solid.
15.	I	NaCl _(aq)	sodium chloride
16.	I	CuSO ₄ • 5H ₂ O _(aq)	copper (II) sulphate pentahydrate
17.	I	(NH ₄) ₂ SO _{4(aq)}	ammonium sulphide
18.	I	Bi ₂ (SO ₄) _{3(aq)}	bismuth (III) sulphate
19.	I	Na ₂ SO ₄ • 10H ₂ O _(aq)	sodium sulphate decahydrate
20.	M	H ₂ O	water
21.	I	Cu ₂ O	copper (I) oxide
22.	E	Ca _(s)	calcium
23.	A	HI _(aq)	hydroiodic acid
24.	E	Rn _(g)	radon gas
25.	M	CH ₃ OH _(l)	ethanol
26.	M	C ₆ H ₁₂ O ₆	sucrose
27.	E	N _{2(g)}	nitrogen gas
28.	A	H ₂ (CO ₃) _(aq)	carbonic acid
29.	M	N ₂ O	dinitrogen monoxide
30.	A	HNO ₂	nitrous acid

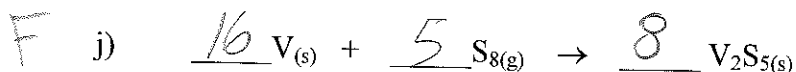
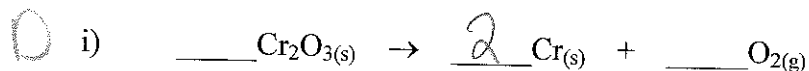
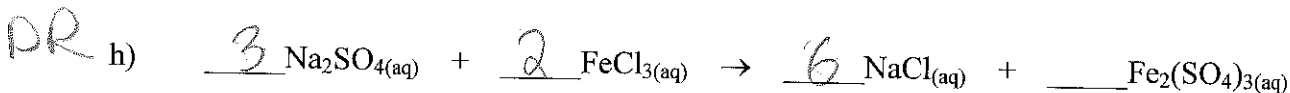
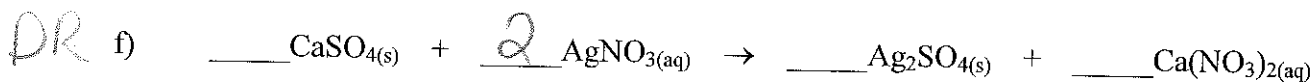
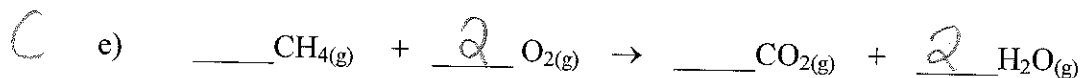
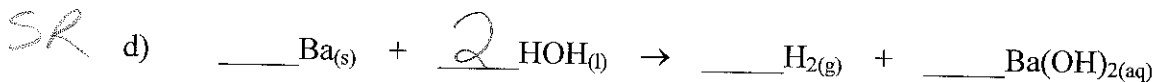
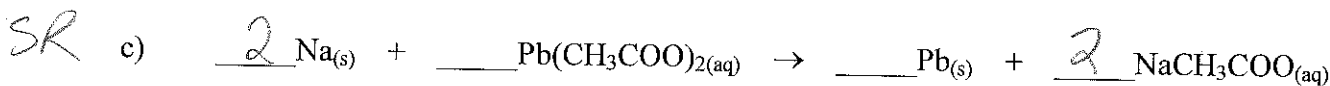
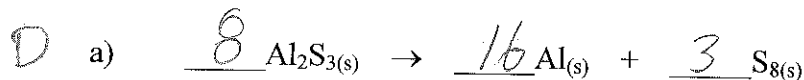
* note: S^{2-} solubility is on back of LAMINATED table

11. After the chemical formula for each compound, state the solubility with either (aq) for soluble or low solubility in water.

- | | |
|---|--|
| 1. K_2S (aq) | 11. $Zn_3(PO_4)_2$ (S) |
| 2. NH_4CH_3COO (aq) | 12. PbI_2 (S) Pb²⁺ |
| 3. $Fe(OH)_3$ (S) | 13. $ZnSO_4$ (aq) |
| 4. $HgBr$ (aq) Hg⁺ | 14. $Cu(NO_3)_2$ (aq) |
| 5. $BaSO_4$ (S) Ba²⁺ | 15. $AgCl$ (S) |
| 6. $CaCl_2$ (aq) | 16. $CdSO_4$ (aq) |
| 7. CuI_2 (aq) Cu²⁺ | 17. NH_4Cl (aq) |
| 8. $Ca(CH_3COO)_2$ (aq) | 18. CuS (S) Cu²⁺ |
| 9. $FeSO_4$ (aq) | 19. $PbCl_2$ (S) Pb²⁺ |
| 10. $Co(NO_3)_2$ (aq) | 20. Na_3PO_4 (aq) |

slightly soluble = S
very soluble = aq

12. Balance the following reactions and give the reaction type:



13. For each of the following word problems, give the reaction type and write out a balanced chemical reaction including all states of matter.

a) Nitrogen triiodide decomposes explosively into its elements.



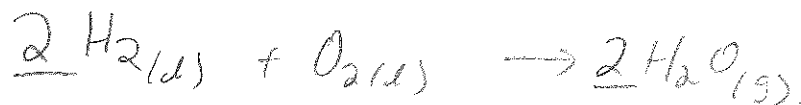
b) In a charcoal barbeque, some of the carbon undergoes incomplete combustion to produce deadly carbon monoxide gas.



c) Solutions of calcium nitrate and potassium phosphate are mixed.



d) The main fuel used to propel rockets into outer space is liquid hydrogen combining with liquid oxygen to produce water vapour.



e) Chlorine gas is bubbled through an aluminum iodide solution.

