

Name _____

Mass Compositions, Formulas, and Names

Dr. Slotsky

1) A dead alkaline battery is found to contain a compound of Mn and O. Its analysis gives 69.6 g Mn and 30.4 g O.

$$69.6 \text{ g Mn} \div \text{_____ amu} = \text{_____ mol Mn}$$

$$30.4 \text{ g O} \div \text{_____ amu} = \text{_____ mol O}$$

Smallest amount of moles is _____ mol _____.

Divide both amounts by the smallest to get Mn _____ O _____

If necessary, multiply by an integer to get whole number formula: Mn__O__

Name the compound! Hint, 'oxide' is O^{2-} . Mn can take different charges.

Name of compound: _____

2) I have a different compound of Mn and O in the cupboard – a nice black pigment, as well as a precursor to other valued pigments for Senior Paint Day. A sample of it can be produced from 63.193 g Mn and 36.807 g O.

$$63.193 \text{ g Mn} \div \text{_____ amu} = \text{_____ mol Mn}$$

$$36.807 \text{ g O} \div \text{_____ amu} = \text{_____ mol O}$$

Smallest amount of moles is _____ mol _____.

Divide both amounts by the smallest to get Mn _____ O _____

If necessary, multiply by an integer to get whole number formula: Mn__O__

Name the compound! Hint, 'oxide' is O^{2-} . Mn can take different charges.

Name of compound: _____

3) I also have a light-pink crystalline compound. A sample of it can be prepared from 3.64 g Mn, 2.12 g S, and 4.24 g O. Find the name and formula.

$$3.64 \text{ g Mn} \div \text{_____ amu} = \text{_____ mol Mn}$$

$$2.12 \text{ g S} \div \text{_____ amu} = \text{_____ mol S}$$

$$4.24 \text{ g O} \div \text{_____ amu} = \text{_____ mol O}$$

Smallest amount of moles is _____ mol _____.

Divide all amounts by the smallest to get Mn _____ S _____ O _____

If necessary, multiply by an integer to get whole number formula: Mn__S__O__

Name the compound! Hint: check the table of polyatomic ions in your book!

Name of compound: _____

Name _____

4) Another common compound of manganese includes potassium and oxygen as well. It is a purple, soluble salt used in water purification and many industrial processes. A sample of it analyzes as 2.47 g K, 3.48 g Mn, 4.05 g O.

$$2.47 \text{ g K} \div \text{_____ amu} = \text{_____ mol K}$$

$$3.48 \text{ g Mn} \div \text{_____ amu} = \text{_____ mol Mn}$$

$$4.05 \text{ g O} \div \text{_____ amu} = \text{_____ mol O}$$

Smallest amount of moles is _____ mol _____.

Divide all amounts by the smallest to get K_____ Mn_____ O_____

If necessary, multiply by an integer to get whole number formula: K__Mn__O__

Name this compound. HINT: we do NOT write manganese first this time!

Potassium (K^+) is the cation. Manganese and oxygen form a polyatomic anion.

This anion is listed in the table in your book.

Name of compound: _____

5) The compound from problem [4] is generally stored in dark bottles. When exposed to light, it tends to decompose into the substance from problem [2] as well as O_2 gas and a new substance (a green, soluble salt). A sample of the new substance analyzes as 3.97 g of K, 2.79 g of Mn, 3.25 g of O.

$$3.97 \text{ g K} \div \text{_____ amu} = \text{_____ mol K}$$

$$2.79 \text{ g Mn} \div \text{_____ amu} = \text{_____ mol Mn}$$

$$3.25 \text{ g O} \div \text{_____ amu} = \text{_____ mol O}$$

Smallest amount of moles is _____ mol _____.

Divide all amounts by the smallest to get K_____ Mn_____ O_____

If necessary, multiply by an integer to get whole number formula: K__Mn__O__

Name this compound. HINT: we do NOT write manganese first this time!

Potassium (K^+) is the cation. Manganese and oxygen form a polyatomic anion.

You may need to look up this anion in your book or, if it's not in your book, online.

HINT: this anion has the same formula as the anion in problem [4], but has a different charge.

Name of compound: _____

Extra Credit: Write a balanced chemical equation for the substance from problem [4] decomposing as described in problem [5]!