

Name:

Class:

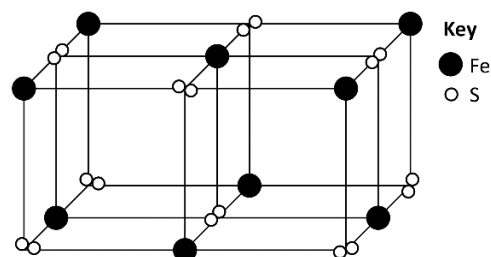


Calcium nitrate contains the ions Ca^{2+} and NO_3^-

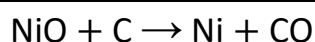
Give the formula of calcium nitrate.



Iron pyrite is an ionic compound.



Determine the formula of iron pyrite.



Calculate the percentage atom economy for the reaction to produce nickel.

Relative atomic masses (Ar): C = 12 Ni = 59 Relative formula mass (Mr): NiO = 75

Give your answer to 3 significant figures.

$$\text{Atom economy} = (\text{Mr of useful product} \div \text{Mr of reactants}) \times 100$$

$$\text{Atom economy} = (59 \div 87) \times 100$$

$$\text{Atom economy} = 67.8\%$$

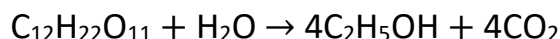
Iron is a transition metal. Sodium is a Group 1 metal.

Give two differences between the properties of iron and sodium.

Allow any **two** of the following also allow converse statements:

- Iron has a high(er) melting / boiling point.
- Iron is dense(r).
- Iron is hard(er).
- Iron is strong(er).
- Iron is less reactive.
- Iron has ions with different charges.
- Iron forms coloured compounds.
- Iron can be a catalyst.

The balanced equation for the production of ethanol from the carbohydrate sucrose is



Calculate the minimum mass of sucrose needed to produce 26.9 g of ethanol.

(relative formula masses: $\text{C}_2\text{H}_5\text{OH} = 46$, $\text{C}_{12}\text{H}_{22}\text{O}_{11} = 342$)

$$\text{Mol of ethanol} = \text{Mass} \div \text{Mr}$$

$$\text{Mol of ethanol} = 26.9 \div 46$$

$$\text{Mol of ethanol} = 0.5848$$

$$\text{Mass of sucrose} = \text{mol} \times \text{Mr}$$

$$\text{Mass of sucrose} = 0.14619 \times 342$$

$$\text{Mass of sucrose} = 50$$

$$\text{mass of sucrose} = \mathbf{50\text{ g}}$$

Give the electronic configuration of a magnesium **atom**.

2, 8, 2

Give the electronic configuration of a aluminium ion.

2, 8