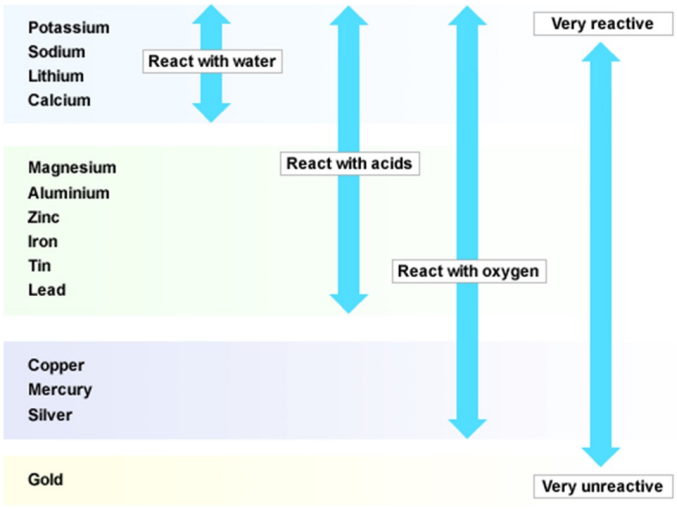
Name _____ Class _____ Date _____/_____/_____

Acids and Metals



Not all metals react with acids, some metals are highly reactive with acids and in some cased just cold water. Other metals will not react even with the strongest acids.

You have carried out some investigations using a selection of metals and dilute hydrochloric acid. Look back at your results and compare them with the reactivity series here.

METAL + ACID -> METAL (ACID) SALT + HYDROGEN

The acid used determines the salt, ie: Hydrochloric Acid will produce Chlorides, Nitric Acid will produce Nitrates etc. The test for Hydrogen is shown in the picture.

▲ If you hear a squeaky pop then hydrogen is present.

A "squeaky" pop will be heard if the gas is Hydrogen, this is because Hydrogen reacts violently with Oxygen when ignited, to form Water.

$$2H_2 + O_2 \rightarrow 2H_2O$$

All the reactions make a solution of a salt, and hydrogen gas:

zinc + hydrochloric acid → zinc chloride + hydrogen

iron + hydrochloric acid → iron chloride + hydrogen

lead + hydrochloric acid → lead chloride + hydrogen

The reaction between Aluminium and Hydrochloric acid is:

WORD EQUATION

"Aluminium plus Hydrochloric Acid gives Aluminium Chloride plus Hydrogen"

$$2Al(s)+6HCl(aq) \rightarrow 2AlCl_3(aq)+3H_2(g)$$

SYMBOL EQUATION

IF WE MIX HYDROCHLORIC AND NITRIC ACIDS TOGETHER IN A 3:1 RATIO (3 PART HCl TO 1 PARTS HNO_3) WE PRODUCE A SUBSTANCE CALLED "NITROHYDROCHLORIC ACID"

This mixture can dissolve GOLD and PLATINUM, these are the KINGS of metals and as such only ROYAL WATER can dissolve them - ROYAL WATER, or "AQUA REGIA" is the acid mix we use.