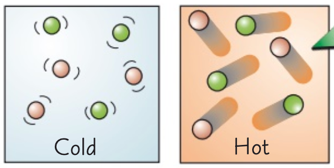
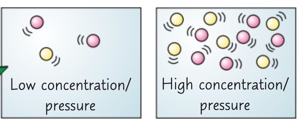
***Chemistry notes:***

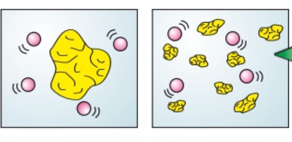
***Topic 6 – The rate and Extent of Chemical Change:***

**Rates of reaction**

* The rate of a chemical reaction is how fast the reactants are changed into products
  + Mean rate of reaction (mol/s or g/s or cm3/s):
    - Quantity of reactant used (mol or g or cm3) / Time taken
    - Quantity of product formed (mol or g or cm3) / Time taken
* The steeper the line on a graph
  + The faster the rate of reaction
* Over time the line becomes less steep as the reactants are used up
* The quickest reactions have the steepest lines and become flat in the least time
* Rate of reaction depends on:
  + Collision frequency (how often they collide)
    - The more collisions there are the faster the reaction is
  + The energy transferred during a collision
    - The particles have to collide with enough energy for a collision to be successful

**Factors affecting rate of reaction**

The rate of a chemical reaction depends on 4 things:

* Temperature
  + When the temperature is increased, the particles all move faster
    - This means that they will collide more frequently
  + Also, the faster they move the more energy they have, so more of the collisions have enough energy to make the reaction occur
* Concentration of a solution / Pressure of gas
  + If the concentration is increased it means that there are more particles in a volume of solvent
  + If there is a higher pressure of gas, it means there are the same number of particles in a smaller space
    - This makes collisions between the reactant particles more frequent
* A screenshot of a cell phone

  Description automatically generatedSurface area
  + If one of the reactants is a solid, then breaking it up into smaller pieces will increase its surface area to volume ratio
  + This means that for the same volume of the solid
    - The particles around it have more area to work on, meaning there will be more frequent collisions
* Presence of a catalyst
  + A catalyst is a substance that speeds up a reaction without being used up in the reaction itself
    - This means that it’s not part of the overall equation
  + They work by decreasing the activation energy required for the reaction to occur