

Overview

- Equations with explanations of variables and units
- Diagrams or graphs
- Explanations of terms or concepts written *IN YOUR OWN WORDS*

EFFECT OF CATALYSTS

Sometimes a reaction might only work if we use very high temperatures, this can cost a lot of money. However we can speed up reactions by using catalysts.

A catalyst is not used up in the reaction, so it can be used over and over. We use different catalysts for different reactions.

HOW DO WE USE CATALYSTS?

For example, we catalyse it in the form of powder.

It acts as a **large surface area**. This gives them a

LARGE SURFACE AREA.

EXOTHERMIC & ENDOOTHERMIC REACTIONS

Some reactions transfer energy **FROM** the reacting chemicals **TO** the surroundings. We call these **exothermic** reactions. The energy transferred from the reacting chemicals goes **into** the surroundings. This means we can measure a **rise** in temperature.

Some reactions transfer energy **FROM** the surroundings **TO** the reacting chemicals. We call these **endothermic** reactions. They take in energy from their surroundings, these reactions cause a drop in temperature as they happen.

EFFECT OF TEMPERATURE

By raising the temperature:

→ particles collide more often

→ particles collide with more energy

WHY?

When we heat up a substance energy is transferred to its particles, this means they move around faster and there are more chances of successful collisions, that are much more energetic!

ACTIVATION ENERGY

The minimum amount of energy required for a reaction to take place!

Faster movement
more energy
more frequent

EFFECT OF CONCENTRATION & PRESSURE

Concentration

There are **more particles** of the reactants moving around in the **same volume** of a solution. The more 'crowded' together the particles are the more likely they will collide. So the more frequent collisions result in a **faster** reaction.

Pressure

Increasing the pressure of reacting gases has the same effect, it **squeezes the gas particles** closely together in a given space. This increases the chance that they will collide and react.

electron configurations

↳ energy levels.

- electron arrangement determines the chemical behaviour of elements
- quantum shells are filled in order of lowest to greatest energy levels; this is due to the probability distribution of orbitals

↑
increasing atomic number

n	s	p	d	f
1st	2e	6e		
2nd	2e	6e		
3rd	2e	6e	10e	
4th	2e	6e	10e	14e

← energy level order

} energy levels

Aufbau Principle

electron configuration: the location and number of electrons in the electron energy levels of an atom
↳ atomic / electron number increases from left to right

- aufbau principle hypothesizes that an atom is built up and assumes their most stable position by filling the lowest available energy orbitals

energy-level diagram: a diagram that represents the relative energies of the electrons in an atom (orbital diagram)

[ENERGY-LEVEL DIAGRAMS]

energy levels increase ↓

no. of boxes

□	→ s ²
□ □	→ p ⁶
□ □ □ □	→ d ¹⁰
□ □ □ □ □ □ □ □	→ f ¹⁴

a=1 b=5 c=7

→ adds 2 new boxes per level

Li: $\begin{array}{|c|} \hline 1s \\ \hline \end{array}$ → 1s² (1 + 1 protons)
→ neutral atoms = # of protons

Ne: $\begin{array}{|c|c|c|} \hline 1s & 2s & 2p \\ \hline \end{array}$ → 1s², 2s², 2p⁶
(N = 7 protons)

anions (-ve): add extra e⁻ to diagonal

cations (+ve): subtract e⁻ from diagonal

CONDENSED ⇒

- represent full previous noble gas
- represent orbitals of noble gas
- first add additional orbitals
- ↳ [Ar] 4s¹ = K
- consider e⁻ needed to fill orbitals

atom can be identified by counting superimposed superscripts

↳ 2s² 2p⁶ 3s² 3p⁴

the number of p

[illegible]

Take notes from video or text in your own words

add-on to notes
from class
(include anything
you might have
left out)

Write down questions you have

Directions

- Decorate the first page with your name/chemistry/block
- Paste your individual QR Code on the inside of cover or first page. (This will be used to take attendance.)
- The next 4 pages (2 pages front and back) should be used for the table of contents. Update it each time you make a page in your notebook. You may want to include divider tabs for each unit as well.
- Start numbering each page after the table of contents.
- Remember you can use this notebook on homework checks so it is to your advantage to show your work and write down the correct answers as we go over questions, graphs, diagrams, and activities.
- Notebooks will be checked randomly throughout the year. Notebook grades will be given at least once a quarter.

Suggestions

- Use colored pencils, graphite pencils, or Pilot FriXion Clicker Retractable Erasable Gel Pens
- Draw diagrams and graphs large enough to see important trends and differences.
- Swap phone numbers or email addresses with classmates so you can communicate on missed assignments.
- If you miss a day, ask a friend how many pages they wrote on and then skip that many pages in order to make up the notes. Add more or less pages if your handwriting is larger or smaller.
- Leave room to add notes and comments in each section. Sometimes other groups will be doing slightly different activities than your own. You will be expected to take notes on how their work was similar and/or different than your own.

