Grade 12 Chemistry

SCH4U

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December 10, 2025

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Chapter 1

Unit 1

1.1 Intro to Quantum

1.1.1 Gold Foil Experiment

- Rutherford's concluded that the atom is mostly empty space with a very dense, positively charged nucleus
- Electrons rotate around the nucleus like planets around the sun
- Thomson's Model of atom: There are only -e in an atom
- By Dalton, elements consist of indivisible small particles (atoms)

1.1.2 Niels Bohr

He suggested that there are stable orbits around the nucleus, where electrons can orbit indefinitely without losing energy

- When Given energy, electrons can "jump" to a higher energy level.
- Enery levels are discrete, a specific amount of energy is required
- So the atom will release/absorb a specific wave length, in other words, a specific color of light

1.1.3 Photoelectric Effect)

Ejection of electrons did not depend upon light intensity, but rather its frequency
Most importantly, light can be either wave or elections.

1.1.4 Heisenberge Uncertainty Principle

Quantum is probability, you do not know the exact position of Quantum.
Balling ball example by Mr. Cheung.

1.1.5 Electron Cloud

Shrodinger's Equation describes the behaviour of an electron in 3 dimensional space. You need four parameters:

$$(n, l, m_l, m_s) \tag{1.1}$$

n describes the energy levels
l describes which kind of house
m_l describes which room
m_s describes which people