LESSON PLAN

CLASS:12 **No. of Periods: 7**

Subject: Physics **Name of the Lesson: ATOMS**

Topics:

- Introduction, alpha particle scattering and Rutherford's nuclear model of atom, alpha particle trajectory, impact parameter, distance of closest approach, electron orbits, atomic spectra ,drawbacks of Rutherford's atom model.
- Bohr's theory of atom, expression for energy of an orbiting electron, energy levels of hydrogen atom, the line spectra of hydrogen atom, hydrogen spectrum, De Broglie's explanation of Bohr's second postulate of quantization, drawbacks of Bohr's atom model

Instructional Objectives

Students will be able to:

- Recognize the different atom models
- Explain the alpha particle scattering experiment and Rutherford's nuclear model of atom
- Defines impact parameter and distance of closest approach with mathematical formulas
- Identifies the drawbacks of Rutherford's atom model
- States the postulates of Bohr's atom model
- Derives the expressions of radius, velocity, kinetic energy, potential energy and total energy of a revolving electron
- Explains the energy levels of a hydrogen atom and the emission spectra

- Illustrates the De Broglie's explanation of Bohr's second postulate of quantization
- Identifies the drawbacks of Bohr's atom model

Methodology

Student centred interactive classes , explanations using diagrams and power point presentations, use of ICT

Teaching aids

Atom model, spectral series, hydrogen spectrum model

Focus questions

1) Discuss Rutherford's scattering experiment. How size of the nucleus is estimated through this experiment?
2) On the basis of Bohr's model derive relation for radii of Bohr's orbit and explain hydrogen spectrum?
3) State the postulates of Bohr's theory of the hydrogen atom. Derive an expression for the energy of an electron in any orbit of hydrogen atom?
4) Discuss the theory of the spectrum of hydrogen atom
5) Discuss the drawbacks of Bohr's atom model

Assignments

- Compare the different atom models
- Represent the spectrum produced by a hydrogen atom with the energy levels