

CHEMISTRY · CHAPTER 2

Structure of Atom

A 1-page guide for parents · 90-second read.

EXPECTED MARKS

9 marks

TIME TO MASTER

12-14 hrs

HELPLINE

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WHAT THIS CHAPTER IS, IN PLAIN ENGLISH

This chapter is the foundation of all chemistry your child will study in Classes 11 and 12. It traces how scientists discovered the inside of the atom — first the electron (Thomson), then the proton (Goldstein), then the nucleus itself (Rutherford), and finally the neutron (Chadwick). The chapter then moves to how electrons are arranged. Bohr proposed that electrons live in fixed energy levels — like rungs of a ladder — and emit light of specific colours when they jump between rungs. This is why each element has a unique spectrum (a kind of barcode). Modern physics has refined this: electrons are not points moving in circles, but probability clouds described by four 'quantum numbers' (n, l, m_l, m_s) which work like a postal address: country, state, city, house number. By the end of the chapter your child should be able to write the electron arrangement of any of the first 30 elements, calculate the energy of light emitted by a hydrogen atom, and explain why no measurement instrument can pin down both the position and the speed of an electron at the same time (Heisenberg's uncertainty).

5 QUESTIONS TO ASK YOUR CHILD

- Can you tell me the THREE postulates of Bohr's atomic model, in your own words?
- What are the FOUR quantum numbers, and what does each one tell us?
- Why does chromium have the configuration $3d^5 4s^1$ instead of $3d^4 4s^2$?
- What is Heisenberg's uncertainty principle, and why don't we notice it for a cricket ball?
- Can you calculate the wavelength of the first line of the Balmer series? Show the steps.

WEAK-SPOT INDICATORS

- Confuses 'orbit' and 'orbital' — uses them interchangeably
- Cannot write electronic configuration past argon ($Z=18$)
- Forgets the $(n+l)$ rule, fills 3d before 4s
- Mixes eV and Joules in the same calculation
- Cannot state the difference between Bohr's model and the quantum mechanical model

WHEN TO WORRY — AND WHAT TO DO

If your child cannot recall $E_n = -13.6/n^2$ eV or the $(n+l)$ filling order even after a week of revision, OR if they score below 4/8 on a basic numerical drill on Bohr's model, please book a 20-minute diagnostic call. This chapter is the launchpad for Chemical Bonding (Ch 4), so weakness here cascades.

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