CHEMISTRY · CHAPTER 3

Classification of Elements and Periodicity in Properties

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

EXPECTED MARKS	TIME TO MASTER	HELPLINE
9 marks	10-12 hrs	70330 05444

WHAT THIS CHAPTER IS, IN PLAIN ENGLISH

This chapter teaches your child that the modern periodic table is not just a wall chart — it's a deep map of how every element behaves, organised by the arrangement of electrons. The chapter starts with Mendeleev's original table (arranged by atomic mass) and shows how Moseley fixed it by switching to atomic number. Your child then learns that elements fall into four 'blocks' (s, p, d, f) based on the last subshell being filled — and that the BLOCK predicts almost everything about how the element behaves. The second half is about TRENDS: as you walk across a row or down a column, properties like atomic size, ionisation energy, electron affinity, and electronegativity change in PREDICTABLE patterns — with a few famous exceptions (nitrogen vs oxygen, beryllium vs boron, fluorine vs chlorine) that examiners love to ask about. By the end of the chapter your child should be able to look at any element's electronic configuration and immediately tell its position in the table, predict its size relative to neighbours, and explain why a few elements break the rules. This chapter is the BRIDGE between atomic structure (Ch 2) and chemical bonding (Ch 4), and underpins all of inorganic chemistry in Class 12.

5 QUESTIONS TO ASK YOUR CHILD

- What is the difference between Mendeleev's periodic law and the modern (Moseley) periodic law?
- Why is the ionisation enthalpy of nitrogen GREATER than that of oxygen, even though oxygen has a higher atomic number?
- Can you arrange these isoelectronic ions by size: O^2-, F^-, Na^+, Mg^2+, Al^3+?
- Why is the electron gain enthalpy of chlorine MORE negative than that of fluorine?
- What is the diagonal relationship? Give one example pair.

WEAK-SPOT INDICATORS

- Cannot quickly tell which BLOCK (s/p/d/f) an element belongs to from its configuration
- Misses the Be>B and N>O exceptions in ionisation enthalpy questions
- Reverses the trend: thinks atomic radius INCREASES across a period
- Confuses electronegativity with electron gain enthalpy
- Cannot place a transition metal (e.g., Z=25 Mn) in the correct group of the modern 1-18 numbering

WHEN TO WORRY — AND WHAT TO DO

If your child cannot correctly predict the period, group, and block for at least 8 out of 10 random elements (Z=1 to 30) after a week of revision, OR if they cannot explain the N>O ionisation anomaly in their own words, please book a 20-minute diagnostic call. This chapter is the

FRAMEWORK on which Chapter 4 (Chemical Bonding) hangs — weakness here cascades into bond polarity, hybridisation, and the whole of Class 12 coordination chemistry.

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