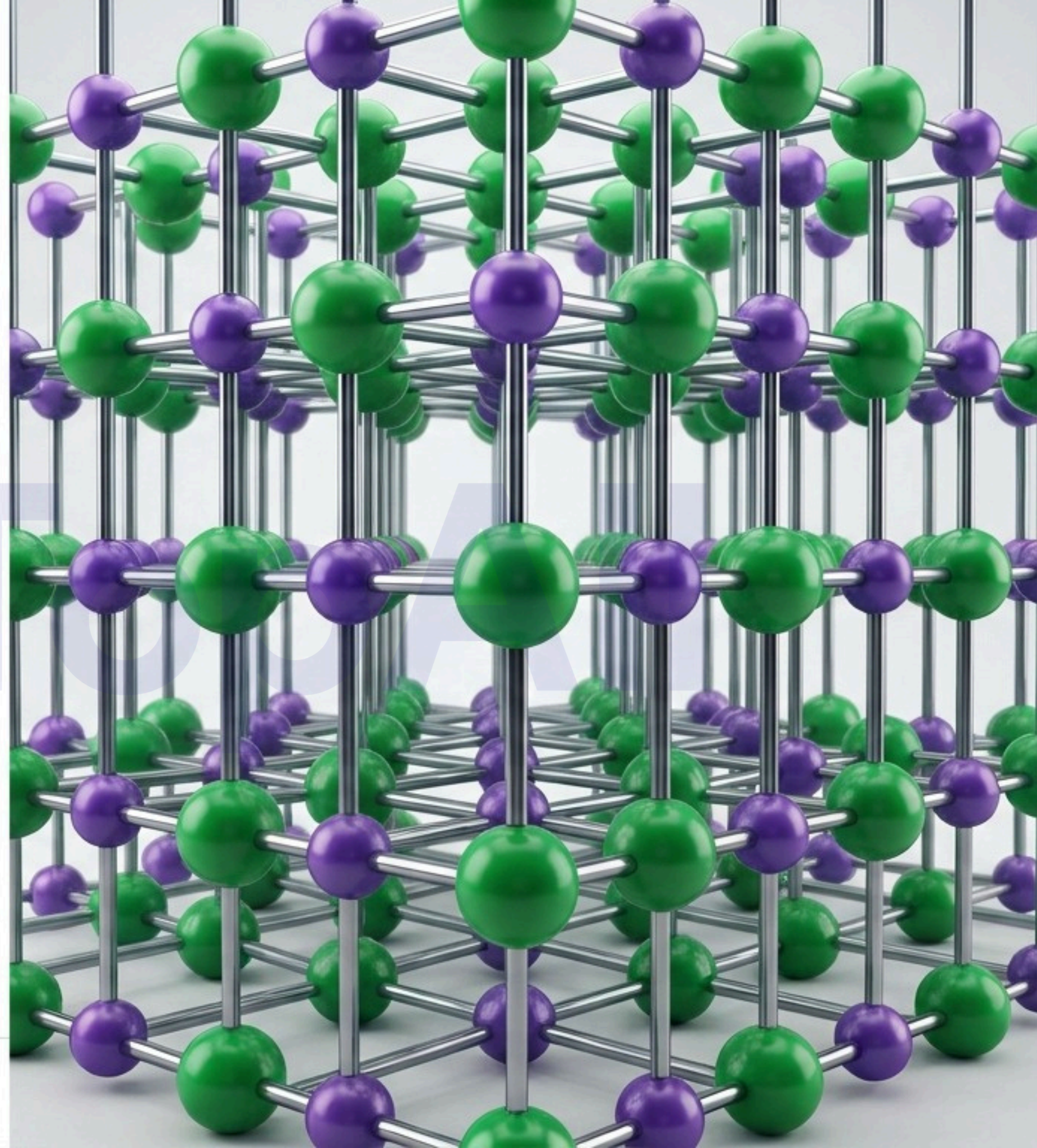


JEE Concept Mastery

Formula Mass of Ionic Compounds

Understanding the Formula
Unit in 3D Lattices

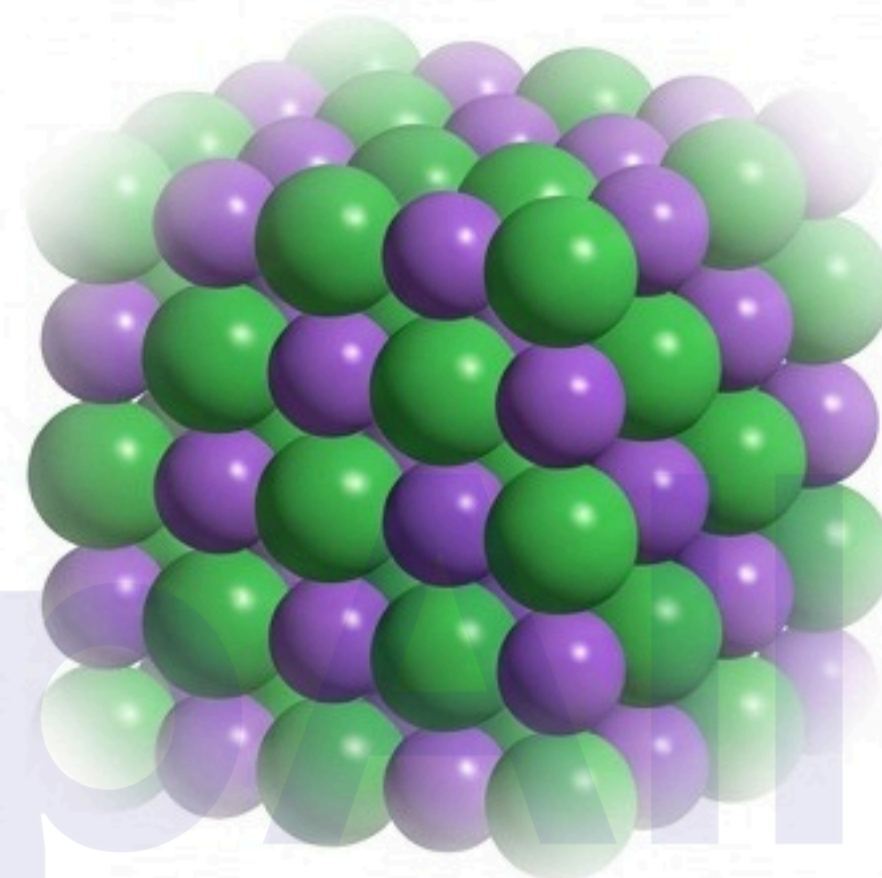


Discrete Molecules



Isolated entities. Made of a fixed, countable number of atoms.

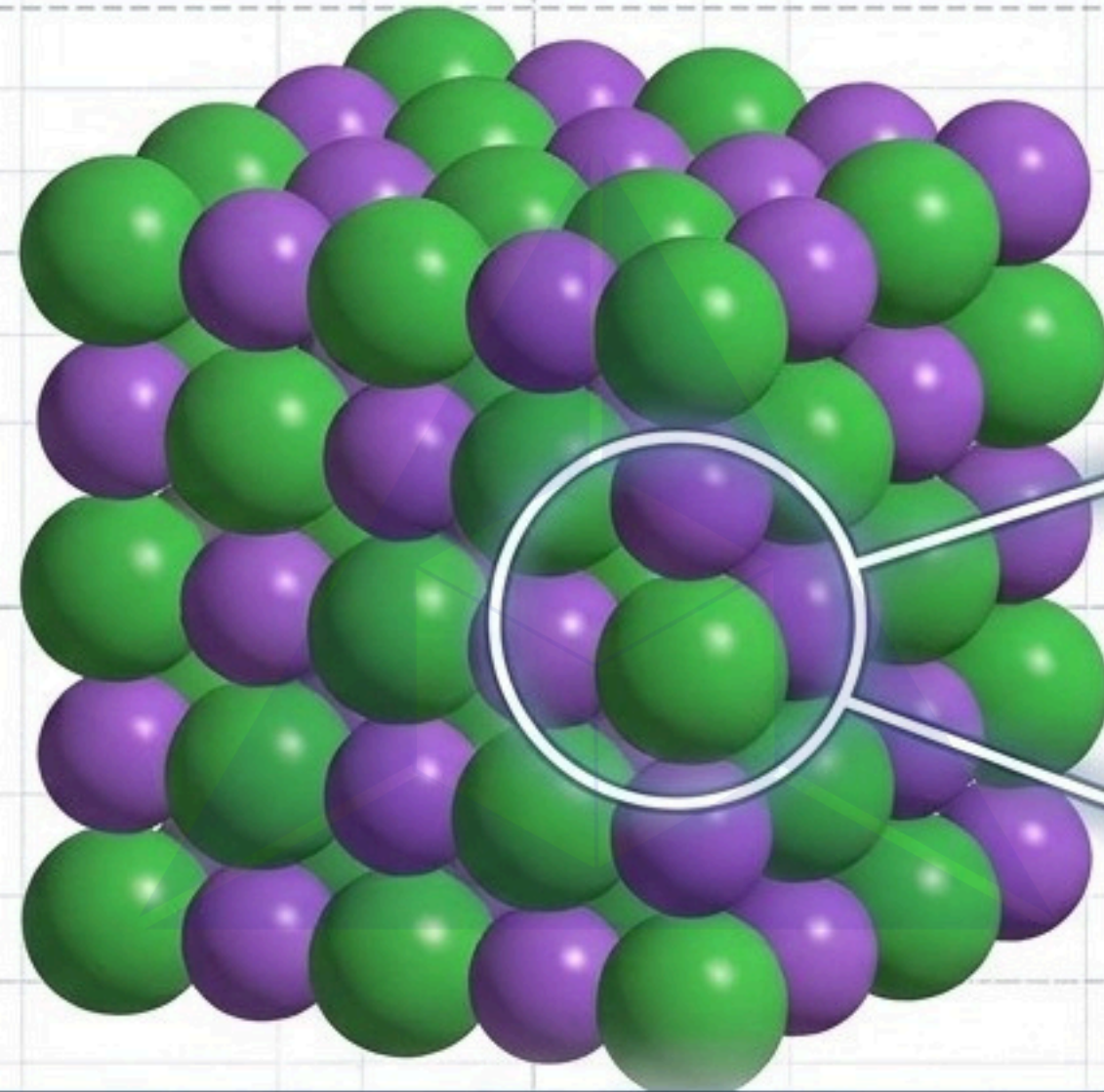
Continuous Lattices



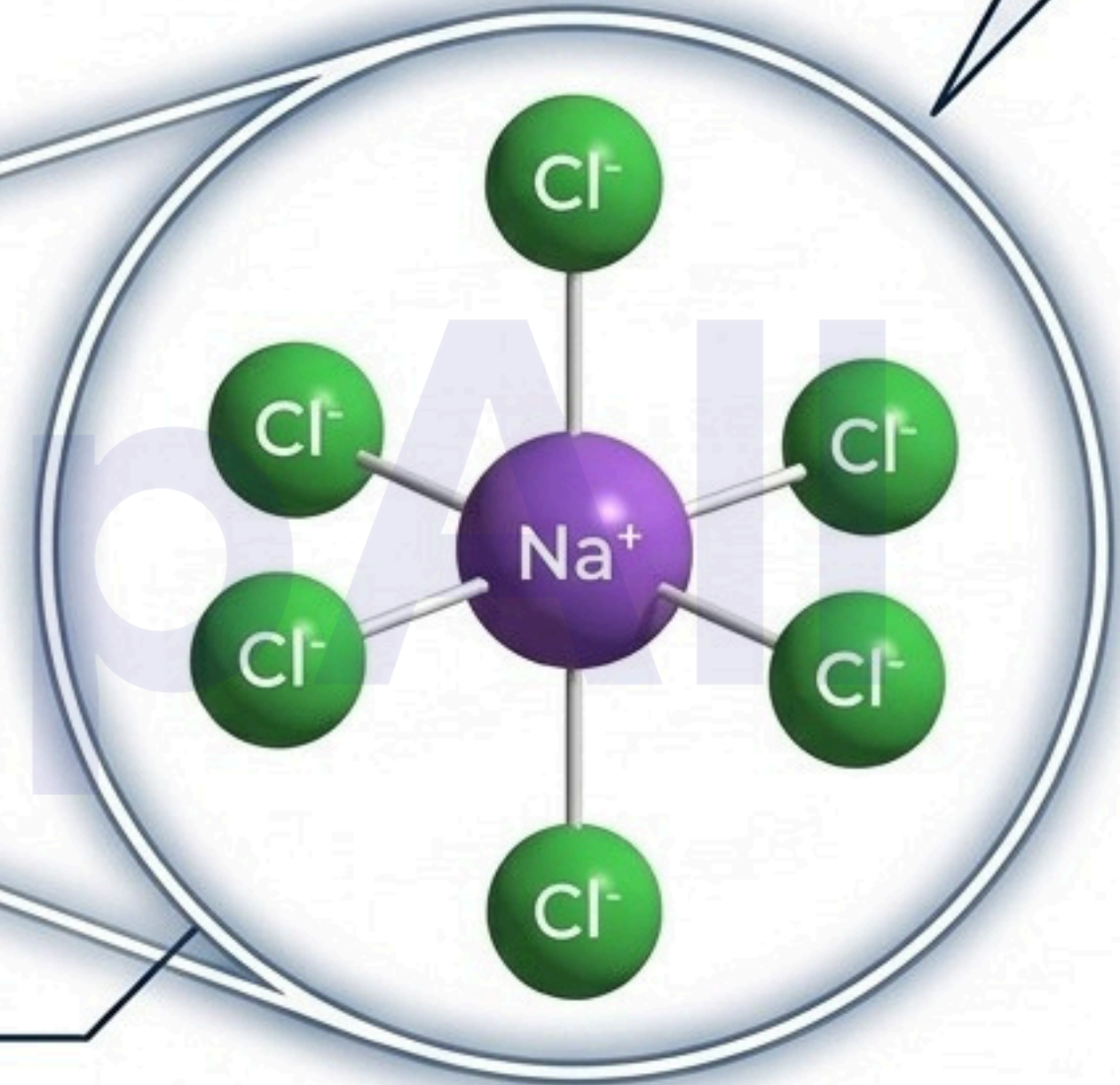
Infinite 3D array of interacting ions.
No isolated units exist.

The **Formula Unit** is the simplest whole-number ratio of ions in an ionic compound. Because ionic solids lack discrete boundaries, we quantify their bulk material using this simplified ratio.

Ionic Coordination & Formula Unit



1 Na^+ is surrounded by exactly 6 Cl^- ions.



(And vice-versa: 1 Cl^- is surrounded by 6 Na^+).

Key Insight: Because of this 6:6 coordination, no single Na-Cl pair can be isolated as a discrete "molecule".



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



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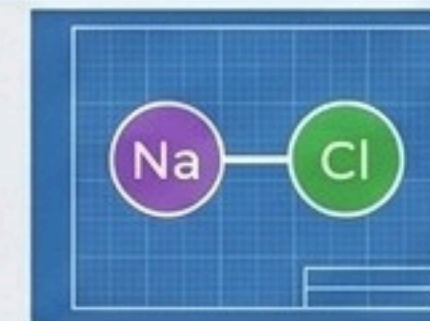


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CALCULATING FORMULA MASS

Formula Mass = Sum of atomic masses of the ions in the empirical formula

Formula mass of NaCl

= Atomic mass of Na + Atomic mass of Cl

= 23.0 u + 35.5 u

= 58.5 u



JEE TRAP ALERT

~~NaCl has a molecular mass of 58.5 u.~~

The Reality: NaCl is NOT a discrete molecule in the solid state.

Using the term 'molecular mass' for ionic solids is technically incorrect. Examiners frequently use this subtle terminology flaw to set conceptual traps in multiple-choice questions.

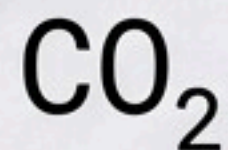
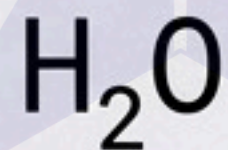
Always look for 'Formula Mass'.

Word Bank



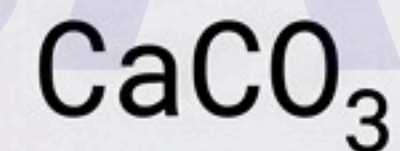
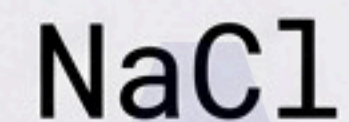
Uses Molecular Mass

Covalent / Discrete Molecules



Uses Formula Mass

Ionic / Continuous Lattices



Self-Check: Can you mentally visualize the distinct boundaries (or lack thereof) for each compound?



REVISION CARD

- Ionic solids form continuous 3D lattices, never discrete molecules.
- We represent ionic compounds using the simplest whole-number ratio, called the Formula Unit.
- Formula Mass = Sum of atomic masses in the formula unit (e.g., $\text{NaCl} = 58.5 \text{ u}$).
- Never use the term 'molecular mass' to describe an ionic compound in a competitive exam.



You've Learned the Theory.

Now Let's Test It.

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