



SOLID STATE

SOLID STATE

MATTER

SOLID STATE

Matter

➤ Anything that

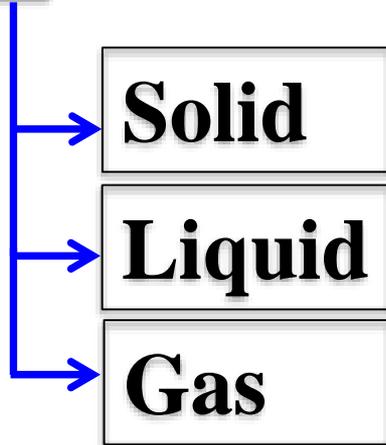
occupies some space and
possesses some mass

What is matter ?



SOLID STATE

Matter



**States of matter that
we come across are...**

SOLID STATE

Matter



States of Matter

Two Conditions

➤ Temperature

Ice

Water

Steam

- Δ = means cooling

yes

SOLID STATE

Matter



- This physical state of matter is the result of interplay of **INTERMOLECULAR FORCES OF ATTRACTION** like
 - **DIPOLE – DIPOLE INTERACTION**,
 - **DIPOLE–INDUCED DIPOLE INTERACTION**,
 - **LONDON FORCES**,
 - **HYDROGEN BONDING** etc.

1. Matter is anything that occupies _____ and possess _____.

a) Some mass, some space

 b) Some space, some mass

c) Some mass, some mass

d) Some space, some space

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2. The general perceivable states of matter that we come across in our daily life are...

 a) 3

b) 5

c) 7

d) 8

3. Physical state of matter is a result of interplay of...

- a)  Intermolecular forces**
- b) Intramolecular forces**
- c) Mutual forces**
- d) Both a & b**

4. Intermolecular forces are...

- a) Dipole - dipole
- b) Dipole induced dipole
- c) London forces
- d)  All of these

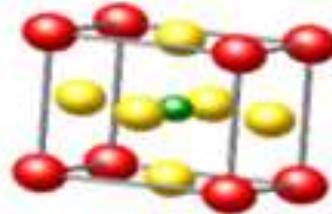
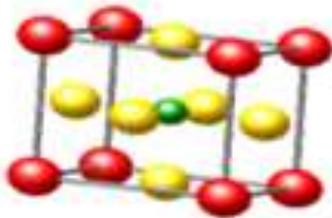
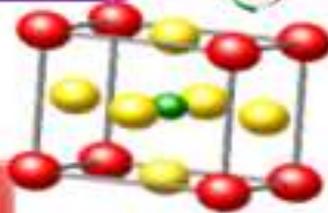
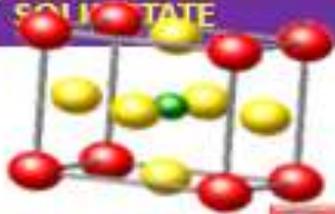
CHARACTERISTIC OF SOLIDS

SOLID STATE

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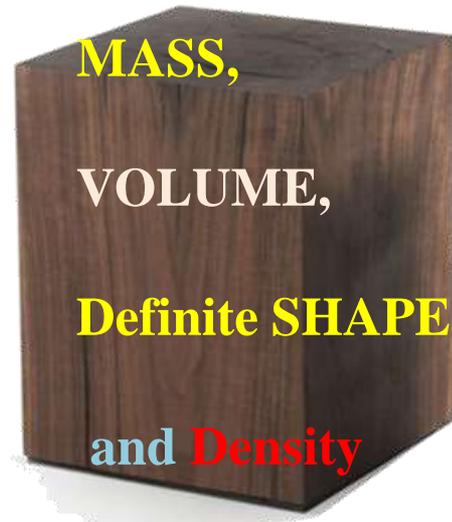
The Solid state



CHARACTERISTICS OF SOLIDS

1. Solids have

Fixed Composition



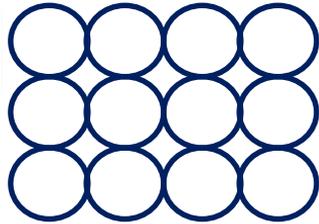
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SOLIDS

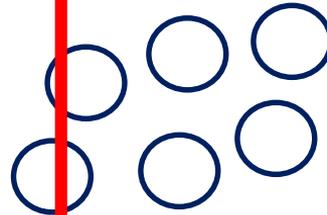
LIQUIDS

GASES

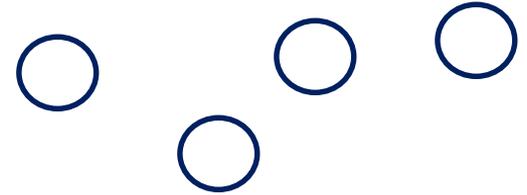
2) **Packing**



More Closely packed



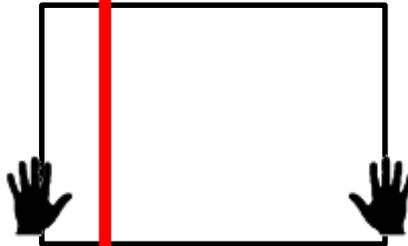
Less closely packed



**Very loose packing
or
Least close packing**

3) **Density**

$$= \frac{\text{Mass}}{\text{Volume}}$$



High

Moderate

Least

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Microscopic view of a solid

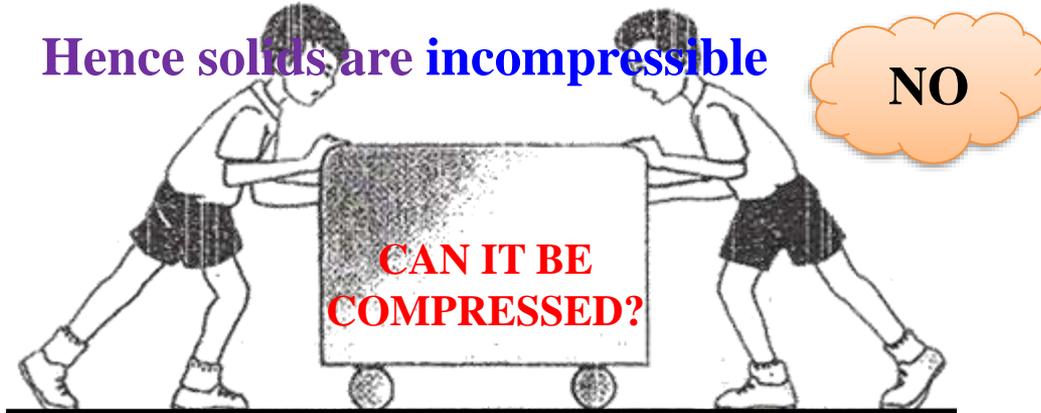


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CHARACTERISTICS OF SOLIDS

- Solids** of **fixed composition** have fixed **MASS**, **VOLUME**, **SHAPE** and **DENSITY**. Order of density : **Solids** > **Liquids** > **Gases**
Exception : **density**_{ICE} < **density**_{WATER}
- In **solids** - Intermolecular distance is shortest

Hence solids are **incompressible**

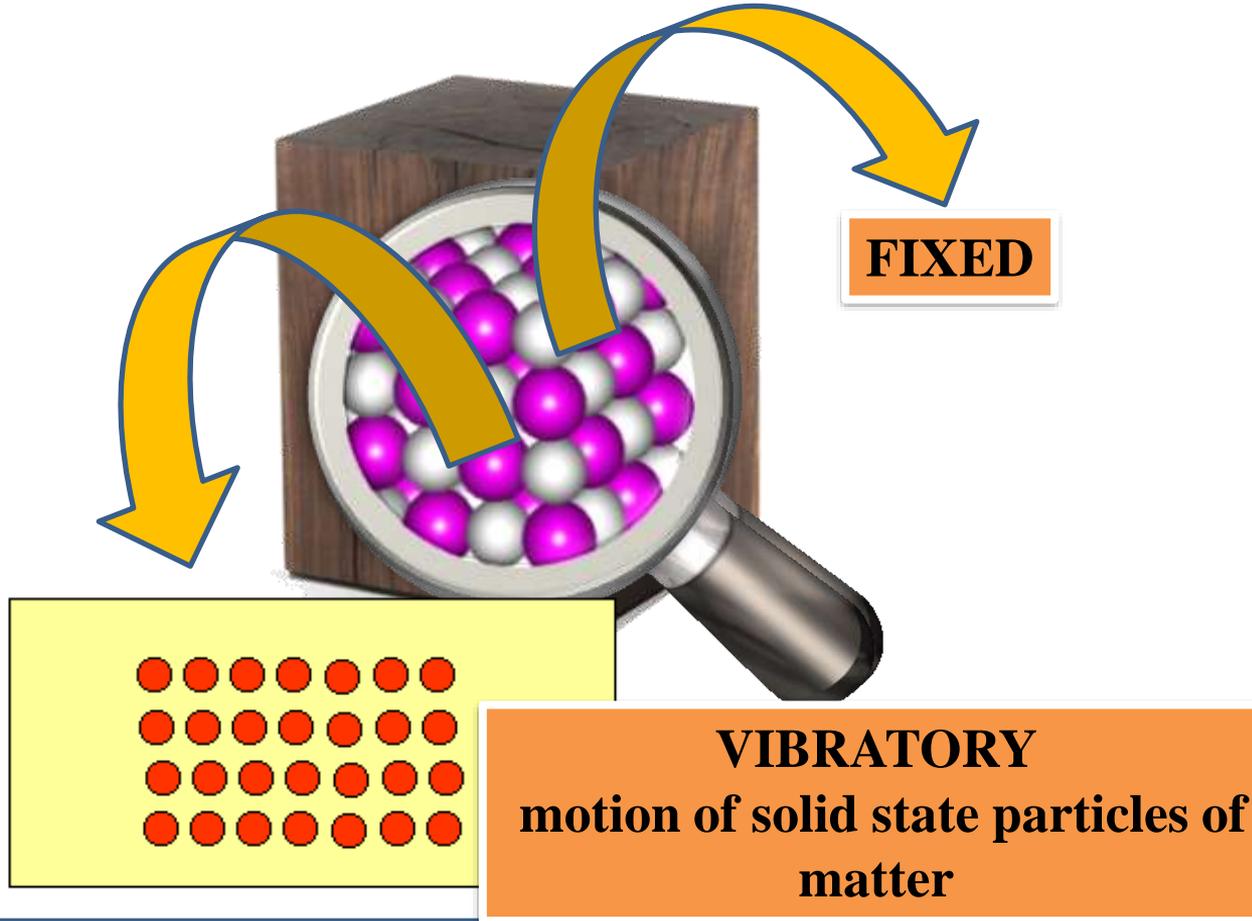


CHARACTERISTIC OF SOLIDS

3. **Solids** have the **strongest intermolecular force of attraction**

- **Solids with weak IMF - low M.P.**
- **Solids with strong IMF - high M.P.**

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1. Solids with fixed composition have fixed...

a) mass

b) volume

c) shape

d)  All of these

2. Solid particles have... intermolecular force of attraction...

a) weak

b) strong

c) moderate

d) zero

3. Solids have...motion

a) linear

b) rotational

c) translational

d) vibratory



4. Select the false statement...

- a) Solids are incompressible**
- b) Solids have small intermolecular distance**
- c)  Solid particles have random position**
- d) Solids have high density**

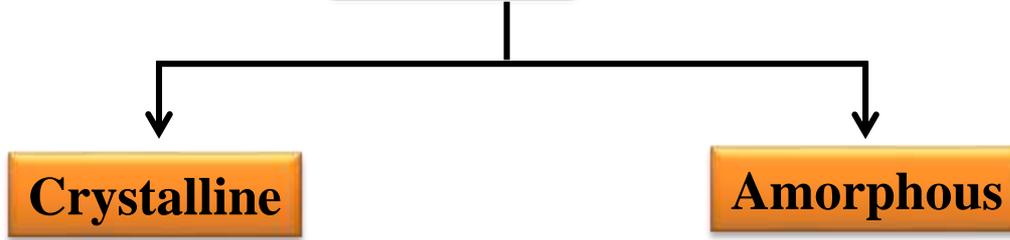
CLASSIFICATION OF SOLIDS

CLASSIFICATION OF SOLIDS

SOLIDS

Crystalline

Amorphous



SOLID STATE

CRYSTALLINE SOLID

CHARACTERISTICS OF CRYSTALLINE SOLID

Regular / uniform / homogenous



Three Dimensional Figure

How Na^+ and Cl^- ion
are arranged in the
crystal lattice?

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CRYSTALLINE SOLID

CHARACTERISTICS OF CRYSTALLINE SOLID

Regular / uniform / homogenous



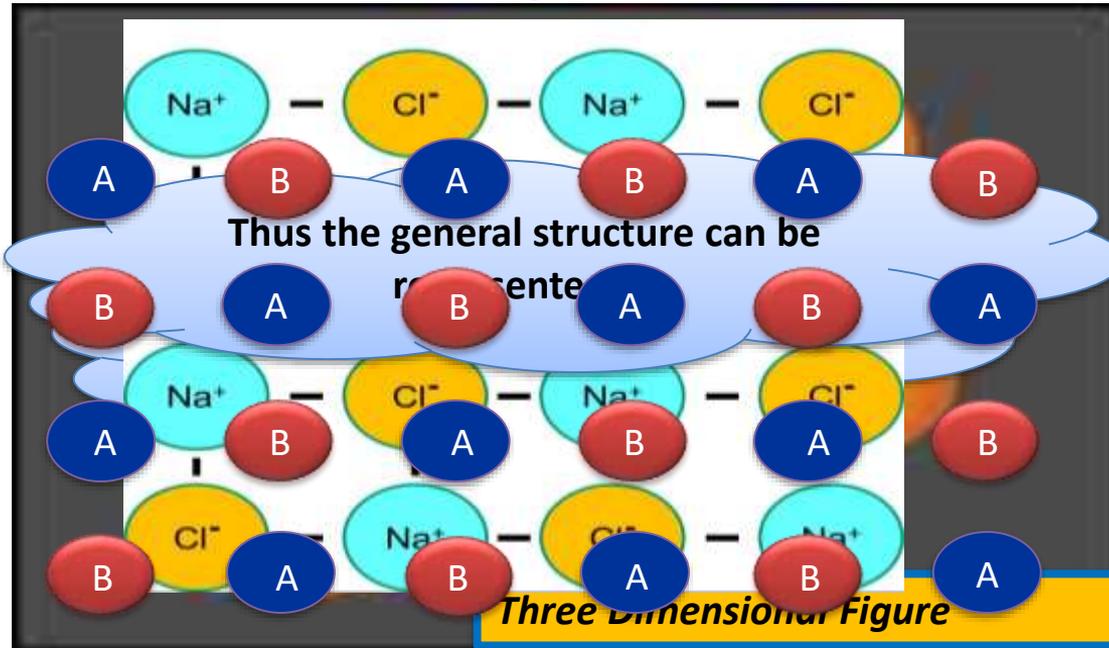
Such homogeneous / uniform arrangement is observed in Crystalline solid.

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CRYSTALLINE SOLID

CHARACTERISTICS OF CRYSTALLINE SOLID

1. Crystalline Solids are homogeneous solids.

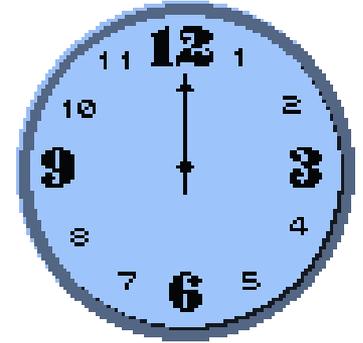
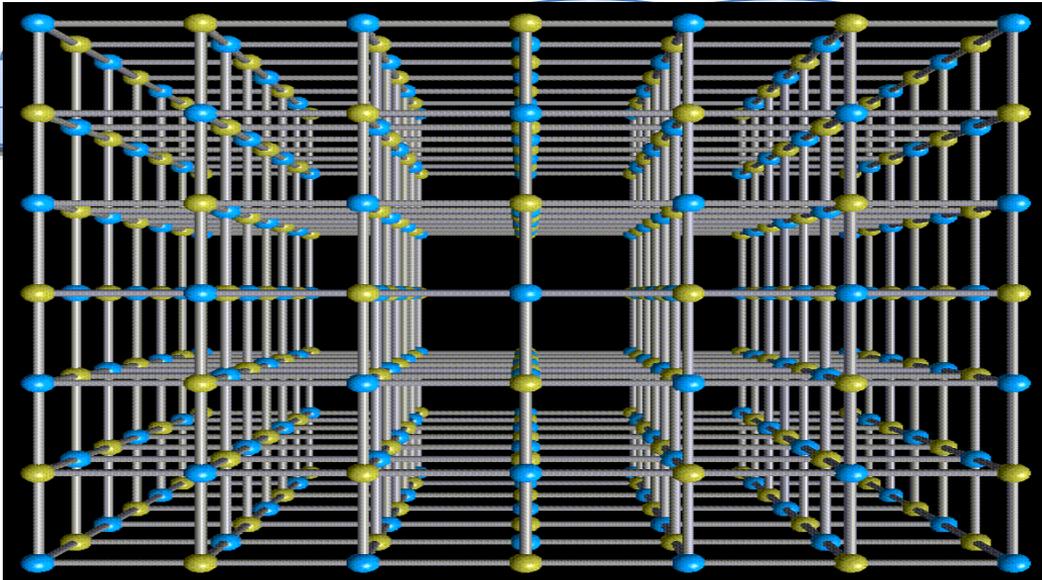


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CRYSTALLINE SOLID

CHARACTERISTICS OF CRYSTALLINE SOLID

1. Crystalline Solids are homogeneous solids.
2. It exhibits long range order.

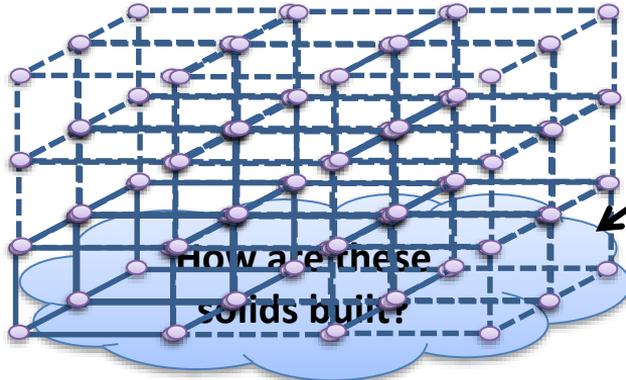


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CRYSTALLINE SOLID

CHARACTERISTICS OF CRYSTALLINE SOLID

1. Crystalline Solids are homogeneous solids.
2. It exhibits long range order.
3. **DEFINITION**: The constituent particles are arranged in definite repeating pattern.
4. They are aggregates of small tiny crystals called unit cell.



UNIT CELL

1. Crystalline solids are... and have -----order

- a)  Homogeneous, long range
- b) Homogeneous, short range
- c) Heterogeneous, long range
- d) Heterogeneous, short range

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2. NaCl is an example of _____ solid.

a) Amorphous

b)  Crystalline

c) Both

d) None

3. Order implies...

- a) Repetivity
- b) Periodicity
- c) Unity
- d) Both a & b



4. The basic unit of crystalline solid is...

- a) Unit cell
- b) Small tiny crystal
- c) Both a & b
- d) None of these

