

Melting Point in Chemistry Questions with Solutions

Q1. Choose the incorrect statement from the following options.

- a.) every pure solid crystalline substance has a characteristic and unique melting point.
- b.) an Impure sample of substance has a different melting point.
- c.) two different pure substances have the same melting points.
- d.) melting point serves as the criteria for the purity of a solid substance.

Correct Answer– (c.) Two different pure substances have the same melting points.

Q2. The ice line is a line that depicts the relationship between the melting point of ice and pressure will be ____.

- a.) a negative slope
- b.) a positive slope
- c.) parallel to the pressure axis
- d.) parallel to the temperature axis

Correct Answer– (a.) A negative slope.

Q3. A piece of ice at 0 degrees Celsius is dropped into the water at 0 degrees Celsius. The ice will then:

- a.) melt
- b.) convert to water
- c.) not melt
- d.) partially melt

Correct Answer– (c.) not melt.

Q4. The purity of the compound is confirmed by ____.

- a.) Its melting point and boiling point
- b.) Chromatographic technique
- c.) Spectroscopy
- d.) All of the above

Correct Answer– (d.) All of the above

Q5. Which of the following metal has the lowest melting point?

- a.) Aluminium
- b.) Sodium
- c.) Mercury
- d.) Tungsten

Correct Answer– (c.) Mercury

Q6. Fill in the blank.

The melting point is also known as the ____ point.

Answer. The melting point is also known as the liquefaction point.

Q7. What happens to kinetic and potential energy when it melts?

Answer. At the melting point, kinetic energy remains constant while potential energy increases.

Q8. What is the effect of impurities on the melting point of solids?

Answer. When we add impurities to a pure substance, the melting point decreases because the impurities weaken the lattice structure of the solid, making it less stable and melting before its original melting point. This is referred to as the melting point depression.

Q9. Why is melting also known as fusion?

Answer. Melting is referred to as fusion because when two separate solid objects made of the same substance are melted, they can combine to form a new one (they fuse).

Q10. Why do different elements have different melting points?

Answer. The melting point of an element or molecule is determined by its molecular mass and intermolecular forces. Elements have varying molecular masses and intermolecular forces. As a result, their melting points differ from those of other elements and compounds.

Q11. Is there any compound that does not have a melting point?

Answer. Yes, some compounds do not have a melting point.

Some compounds are not heat stable. When such a compound is heated, it decomposes into another substance.

Example:

When heated, nickel carbonate (NiCO_3) decomposes into NiO and CO_2 .

Q12. What are the factors on which the melting point depends?

Answer. The melting point is determined by the amount of energy required to overcome the forces that hold molecules together in a lattice.

The stronger the intermolecular forces, the more energy is required, and thus the melting point is higher.

The factors on which melting point depends are:

- Intermolecular forces
- Shape of the molecules
- Size of the molecules

Q13. Why are the melting points of d block elements higher than those of s block elements?

Answer. More electrons can be contributed to the metallic lattice by d block elements. For example, vanadium can contribute 5 electrons. S block elements, on the other hand, can only contribute one or two electrons. Alkali metals have one electron, and alkali earth metals have two. More electrons added to the metallic lattice increase the strength of metallic bonds.

Thus, d-block elements have higher melting points due to stronger metallic bonds.

Q14. Why do alkaline earth metals have lower melting points than alkali metals?

Answer. Alkali and alkaline earth metals are both in the s block. Each metal atom in alkali metals has only one valence electron. Alkaline earth metals, on the other hand, have two valence electrons per metal atom.

- Alkali earth metals are smaller than alkali metals in size.
- The metallic bond becomes stronger as the number of valence electrons in the lattice increases.
- Metallic bonds become stronger as the atomic radius decreases. Alkali earth metal metallic bonds are much stronger than alkali metal metallic bonds.

As a result, the melting points of alkali metals are lower than those of alkali earth metals.

Q15. Why are the melting and boiling points of different elements and compounds different?

Answer. There are numerous factors that influence the melting and boiling points of elements and compounds. Melting and boiling points can be affected by one or more factors.

- Molecular mass - as molecular mass increases, so does the possibility of increasing melting and boiling points.
- Hydrogen bonds, dipole-dipole attraction forces, and van der Waals forces between atoms or molecules are examples of intermolecular forces. When intermolecular forces become stronger, the melting and boiling points of elements and compounds rise as well.
- Metallic lattice (important to decide melting points of metals such as sodium, magnesium and other metal elements)
- Ionic lattice - Ionic lattice exists in ionic compounds such as NaCl, CaF_2 , and MgO. Melting and boiling points can differ depending on the strength of the ionic lattice.

Practise Questions on Melting Point

Q1. The melting point of ice will ____.

- a.) Increase with increasing pressure.
- b.) Decrease with increasing pressure.
- c.) Is pressure independent.
- d.) Is proportional to the pressure.

Correct Answer– (b.) Decrease with increasing pressure.

Q2. Which of the following element has the lowest melting point?

- a.) Hydrogen
- b.) Helium
- c.) Lithium
- d.) Germanium

Correct Answer– (b.) Helium.

Q3. What causes a melting point to occur?

Answer. When a solid is heated, its temperature rises until it reaches the melting point. More heat will then convert the solid to a liquid without changing the temperature. The additional heat will raise the temperature of the liquid once all of the solid has melted.

Q4. Differentiate between melting point and boiling point.

Answer. The melting point is the constant temperature at which a solid transforms into a liquid. At a temperature of 0°C , ice cubes begin to melt and change state from solid to liquid.

The constant temperature at which a liquid begins to change into a gas is referred to as the boiling point.

For example, the boiling point of water is 100°C .

Q5. What is the melting point trend in the periodic table?

Answer. The melting point trend in the periodic table is as follows:

- On moving from left to right across a period in a periodic table, the melting point of an atom first increases and then decreases.
- On moving from top to bottom, down the group in the periodic table, the melting point decreases.