

Types of Solids Worksheet

Determine if the following compounds are metallic solids, ionic solids, network atomic solids, molecular solids, or amorphous solids based on their properties. These are all actual chemical compounds.

- 1) This material forms crumbly crystals and has a melting point of 16.6° Celsius. It has a low density in solid form.
_____ (acetic acid)
- 2) This material forms very hard colorless crystals. It does not dissolve in water and burns at high temperatures.
_____ (diamond)
- 3) This material forms colorless crystals that have a melting point of 661° C. It is hard, brittle, and dissolves well in water.
_____ (sodium iodide)
- 4) This material forms silver crystals that do not dissolve in water and have a melting point of 1414° C. This material is very hard and is not a good conductor of electricity.
_____ (silicon)
- 5) This material is hard and melts at a temperature of 1610° C. It dissolves only with difficulty in very reactive acids and doesn't conduct electricity when molten. It forms colorless crystals.
_____ (quartz)
- 6) This material is soft and doesn't form crystals. It has a melting point of 660° C. It doesn't dissolve in water. It is used as a structural material in the construction of airplanes and rockets.
_____ (aluminum)
- 7) This material is easily scratched. It is black and has a melting point of 185° C. It is used for applications where lightweight, nonstructural materials are required.
_____ (plastic)

Types of Solids Worksheet - Solutions

Determine if the following compounds are metallic solids, ionic solids, network atomic solids, molecular solids, or amorphous solids based on their properties. These are all actual chemical compounds.

- 1) This material forms crumbly crystals and has a melting point of 16.6° Celsius. It has a low density in solid form.

This is acetic acid, a molecular solid. The low melting point indicates that it's not a network atomic solid or ionic solid, and the fact that it forms crystals rules out metals and amorphous solids.

- 2) This material forms very hard colorless crystals. It does not dissolve in water and burns at high temperature.

This is diamond, a network atomic solid. Network atomic solids are very much like ionic compounds except that they tend not to dissolve in water and are somewhat more reactive.

- 3) This material forms colorless crystals that have a melting point of 661° C. It is hard, brittle, and dissolves well in water.

This is sodium iodide, an ionic solid. The high melting point, crystalline form, hardness, brittleness, and above all, solubility all point toward this conclusion.

- 4) This material forms silver crystals that do not dissolve in water and have a melting point of 1414° C. This material is very hard and is not a good conductor of electricity.

This is silicon, a network atomic solid. The high melting point rules out amorphous solids and molecular solids, and the crystalline form rules out metals. The color indicates that it is not an ionic compound.

- 5) This material is hard and melts at a temperature of 1610° C. It dissolves only with difficulty in very reactive acids and doesn't conduct electricity when molten. It forms colorless crystals.

This is quartz, a network atomic solid. The fact that it doesn't conduct electricity when dissolved is the primary one that points away from ionic solid.

- 6) This material is soft and doesn't form crystals. It has a melting point of 660° C. It doesn't dissolve in water. It is used as a structural material in the construction of airplanes and rockets.

This is aluminum, a metal. The high melting point, coupled with the noncrystalline form pretty much rules out everything else. Ionic compounds and network atomic solids are generally too brittle to be used as structural materials.

- 7) This material is easily scratched. It is black and has a melting point of 185° C. It is used for applications where lightweight, nonstructural materials are required.

This is plastic, an amorphous solid. The color is atypical of other solids, as is the fact that it is fairly soft. The low density is also typical of many amorphous solids.