



High School Science Virtual Learning

Chemistry Solids

May 6, 2020



High School Chemistry

Lesson: [5/6/20]

Objective/Learning Target:
Students will be able to explain solids.

Let's Get Started:

1. How much 2.5 M NaOH solution can be made by diluting 500. mL of 6.0 M NaOH?
2. Suzy Scientist poured 350 mL of a 5.00 M KCl solution into a large erlenmeyer flask and set it on the lab bench. While retrieving her lab notebook Hapless Harry thinking it was distilled water filled the flask to the 0.75 liter mark so he could use it for his experiment. What Molarity is the solution now?

Let's Get Started: Answer Key

1. $M_1V_1 = M_2V_2$

$$6.0 \text{ M} \times 500. \text{ mL} = 0.25 \text{ M} \times V_2$$

$$V_2 = \frac{6.0 \text{ M} \times 500. \text{ mL}}{2.5 \text{ M}} = 1200 \text{ mL}$$

2. $M_1V_1 = M_2V_2$

$$5.0 \text{ M} \times 350 \text{ mL} = M_2 \times 750 \text{ mL}$$

$$M_2 = \frac{5.0 \text{ M} \times 350 \text{ mL}}{750 \text{ mL}} = 2.3 \text{ M}$$



Lesson Activity:

Directions:

1. Answer the questions on the handout as you watch the video.

Links:

- Video: [Solid](#)
- Handout: [Solid Video Worksheet](#)

Lesson Activity Continued:

Directions:

- Use the following pictures to help answer the practice problems.

Property	Crystalline solids	Amorphous solids
Shape	Definite characteristic geometrical shape	Irregular shape
Melting point	Melt at a sharp and characteristic temperature	Gradually soften over a range of temperature
Cleavage property	When cut with a sharp edged tool, they split into two pieces and the newly generated surfaces are plain and smooth	When cut with a sharp edged tool, they cut into two pieces with irregular surfaces
Heat of fusion	They have a definite and characteristic heat of fusion	They do not have definite heat of fusion
Anisotropy	Anisotropic in nature	Isotropic in nature
Nature	True solids	Pseudo solids or super cooled liquids
Order in arrangement of constituent particles	Long range order	Only short range order.

Lesson Activity Continued:

- Types of Crystalline Solids

Table 11.5 Properties of the Different Types of Solids

Type of Solid	Melting Point	Hardness and Brittleness	Electrical Conductivity
Molecular	Low	Soft and brittle	Nonconducting
Metallic	Variable	Variable hardness; malleable	Conducting
Ionic	High to very high	Hard and brittle	Nonconducting solid (conducting liquid)
Covalent network	Very high	Very hard	Usually nonconducting

Practice

Complete the following questions using the information you learned during the lesson activity.

Questions:

1. Compare and contrast the arrangement of particles at the atomic level for a liquid and a solid.
2. Explain the properties of solids using the kinetic theory of matter.
3. What happens to the average kinetic energy of particles in a substance when temperature is increased?
4. What is the vaporization of a solid known as?
5. Explain why solids have a definite shape?

Once you have completed the practice questions check with the **answer** key.

1. Particles in a solid are packed close together in an orderly arrangement. The arrangement of particles in a liquid is more random.
2. Solids have slowed down enough that the neighboring molecules can pull harder, keep them in contact, lock them in position (only allowing vibration) and since they're locked in position they have an orderly arrangement, and thus cannot change shape or volume.
3. The average kinetic energy of the particles in a substance is increased as the temperature of the substance increases.
4. Sublimation
5. Particles in a solid have low kinetic energy and are tightly packed together.

More Practice:

Follow the links below to do more practice.

1. [States of Matter](#)
2. [The Solid State](#)



Additional Practice:

Click on the link below for additional practice.

[Quiz](#)