


<div style="font-size: 100px; text-align: center;">W</div>	102 Describing Matter	
	OBJECTIVES 102.1 Define matter 102.2 Describe the characteristics of the three states of matter 102.3 Name the phase changes that matter undergoes 102.4 Distinguish between endothermic and exothermic reactions 102.5 Describe the energy changes that accompany phase changes	

102.1 Matter

1. Define matter.

Laboratory Activity 102 Exploring Matter

Propose an experiment to investigate if air can be classified as matter.



102.2 States of Matter

2. Identify which state(s) of matter has particles in a uniform composition. _____
3. Identify which state(s) of matter can take the shape of its container. _____
4. Identify which state(s) of matter has a fixed volume. _____
5. Use the key below to draw the liquid and gas phases of CO_2 .
Include at least 6 molecules of CO_2 in each phase.

Key
○ = CO_2 molecule



102.3 Phase Change

Identify the name of the following phase changes:

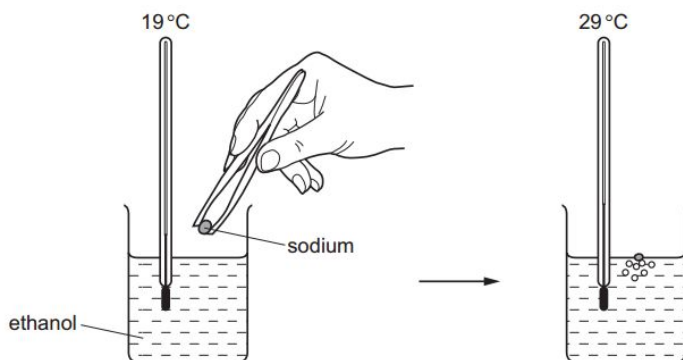
6. A solid changes into a liquid.

7. A liquid changes into a gas.

8. A solid changes directly into a vapor.

102.4 Endothermic and Exothermic Changes

9. Determine if the reaction shown below is endothermic or exothermic. Explain your answer.



102.5 Energy and Phase Change

10. Identify which process is exothermic.

(1) boiling of water

(3) condensation of vapor

(2) melting of copper

(4) sublimation of iodine

11. Identify which phase change is an exothermic process.

(1) $\text{CO}_2(\text{s}) \rightarrow \text{CO}_2(\text{g})$

(3) $\text{Cu}(\text{s}) \rightarrow \text{Cu}(\text{l})$

(2) $\text{NH}_3(\text{g}) \rightarrow \text{NH}_3(\text{l})$

(4) $\text{Hg}(\text{l}) \rightarrow \text{Hg}(\text{g})$

12. Identify which physical changes are endothermic.

(1) melting and freezing

(3) condensation and sublimation

(2) melting and evaporating

(4) condensation and deposition

13. Which change is exothermic?

(1) freezing of water

(3) melting of iron

(2) vaporization of ethanol

(4) sublimation of iodine