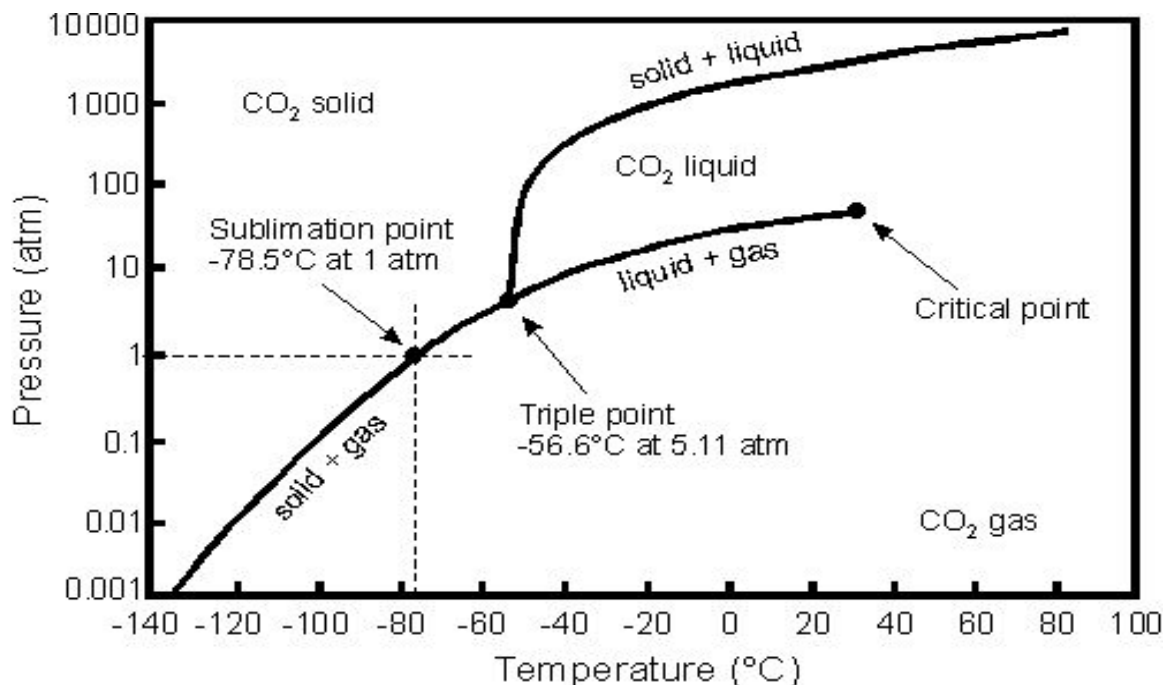


## Comparing Phase Diagrams: Carbon Dioxide and Water

### Phase Diagram for CO<sub>2</sub>



- 1) Color the solid part red, the liquid part blue and the gas part yellow
- 2) What do the **solid lines** on the diagram represent?

3) What temperature and pressure does the **critical point** exist at for CO<sub>2</sub>? T = \_\_\_\_\_ P = \_\_\_\_\_

Explain what happens at the **critical point**:

4) What temperature and pressure does the **triple point** exist at? T = \_\_\_\_\_ P = \_\_\_\_\_

Explain what happens at the **triple point**:

5) What phase would CO<sub>2</sub> be in at -60 °C and 0.01 atm? \_\_\_\_\_

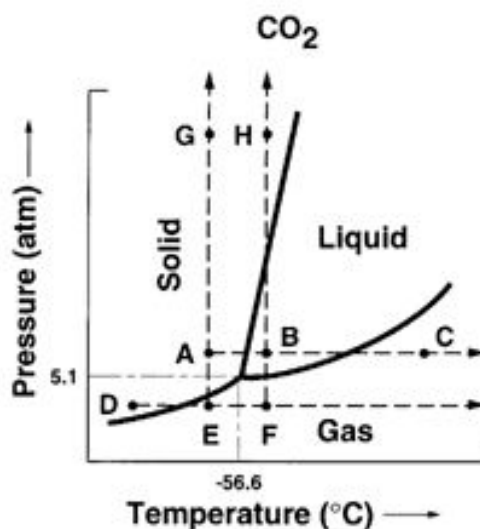
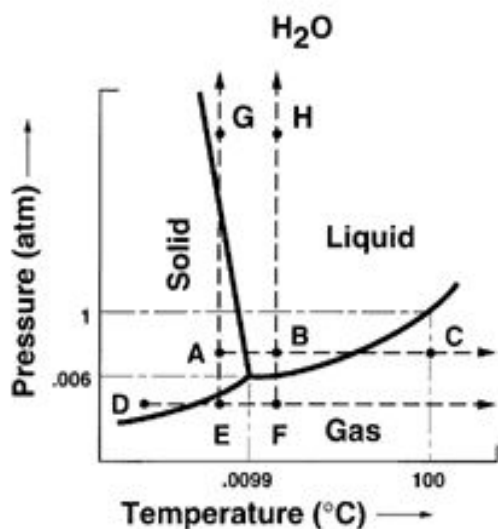
6) What would happen if the temperature stayed at -60 °C, but the pressure increased to 10 atm?

7) What phase would CO<sub>2</sub> be in at room temperature (22 °C) and pressure at sea level (1 atm)? \_\_\_\_\_

8) What would happen if the pressure increased to 100 atm but the temperature was still 22 °C?

# The Phase Diagrams of H<sub>2</sub>O and CO<sub>2</sub>

1. Dry ice is CO<sub>2</sub> in SOLID form. **Why does dry ice create a "fog" when placed on a table at room temperature?** (Hint: What phase change is occurring?)



**Looking at the phase diagrams of both carbon dioxide and water answer the following questions**

What is the state of matter of H<sub>2</sub>O and CO<sub>2</sub> at point E? H<sub>2</sub>O: \_\_\_\_\_ CO<sub>2</sub>: \_\_\_\_\_

What happens to H<sub>2</sub>O as it moves from point E to point A? \_\_\_\_\_

What happens to CO<sub>2</sub> as it moves from point E to point A? \_\_\_\_\_

What is/are the state(s) of matter at point A? H<sub>2</sub>O: \_\_\_\_\_ CO<sub>2</sub>: \_\_\_\_\_

What happens to H<sub>2</sub>O as it moves from point A to point G? \_\_\_\_\_

What happens to CO<sub>2</sub> as it moves from point A to point G? \_\_\_\_\_

What is/are the state(s) of matter at point G? H<sub>2</sub>O: \_\_\_\_\_ CO<sub>2</sub>: \_\_\_\_\_

What happens to H<sub>2</sub>O as it moves from point A to point B? \_\_\_\_\_

What happens to CO<sub>2</sub> as it moves from point A to point B? \_\_\_\_\_

What is/are the state(s) of matter at point B? H<sub>2</sub>O: \_\_\_\_\_ CO<sub>2</sub>: \_\_\_\_\_

What happens to H<sub>2</sub>O as it moves from point B to point H? \_\_\_\_\_

What happens to CO<sub>2</sub> as it moves from point B to point H? \_\_\_\_\_

What is/are the state(s) of matter at point H? H<sub>2</sub>O: \_\_\_\_\_ CO<sub>2</sub>: \_\_\_\_\_

What happens to H<sub>2</sub>O as it moves from point B to point C? \_\_\_\_\_

What happens to CO<sub>2</sub> as it moves from point B to point C? \_\_\_\_\_

What is/are the state(s) of matter at point C? H<sub>2</sub>O: \_\_\_\_\_ CO<sub>2</sub>: \_\_\_\_\_

**Using your answer from above:**

List 3 ways the Phase Diagram for H<sub>2</sub>O is similar to the Phase Diagram for CO<sub>2</sub>:

List 3 ways the Phase Diagram for H<sub>2</sub>O is different than the Phase Diagram for CO<sub>2</sub>: