

Properties

Recall that **physical properties** can be observed without producing new substances. **Chemical properties** describe how a substance interacts (or fails to interact) with other substances to produce new substances. **Extensive properties** depend upon the amount of matter in the sample; **intensive properties** do not.

Classify each of the properties listed below as **extensive physical**, **intensive physical**, or **chemical**.

- | | |
|---|-----------|
| 1. Color | 1. _____ |
| 2. Combustibility | 2. _____ |
| 3. Hardness | 3. _____ |
| 4. Density | 4. _____ |
| 5. Mass | 5. _____ |
| 6. Melting point | 6. _____ |
| 7. Ductility | 7. _____ |
| 8. Volume | 8. _____ |
| 9. Failure to react with other substances | 9. _____ |
| 10. Odor | 10. _____ |
| 11. Weight | 11. _____ |
| 12. Malleability | 12. _____ |
| 13. Tendency to corrode | 13. _____ |

Some of the measured properties of a given substance are listed below. Write the general name describing each property. Select the names from the properties listed for Exercises 1–13 above.

- | | |
|---|-----------|
| 14. 15 mL | 14. _____ |
| 15. Can easily be hammered into sheets. | 15. _____ |
| 16. 2.8 g/mL | 16. _____ |
| 17. Burns when heated in the presence of O ₂ . | 17. _____ |
| 18. Stinks when heated. | 18. _____ |
| 19. Can be scratched by a diamond. | 19. _____ |
| 20. 500°C | 20. _____ |
| 21. Can easily be drawn into a wire. | 21. _____ |

Identify at least three physical changes and three chemical changes described in the paragraph below. Write your answers in the space provided.

Last Saturday, I decided to bake a chocolate cake from scratch. The first thing I did before I began baking was to light the oven so that it could heat up. I then placed a stick of butter in a saucepan on the stove and melted the butter because the recipe called for melted butter. The second ingredient was flour. It is amazing to me how a wheat kernel was planted and then used energy from the sun to grow into a wheat plant, which then produced more kernels, which were ground into flour I was using. Next, I cracked open an egg and added it to the mixture. Realizing that the recipe called for two eggs, I looked in the refrigerator and noticed that there were no more eggs. Frustrated, I threw down my spoon, which caused a bowl to fall off the countertop and break. All of a sudden, I smelled something burning. A Paper towel that I had accidentally played in the oven had caught on fire.

1. Physical Changes

- a.
- b.
- c.

2. Chemical Changes

- a.
- b.
- c.

Phases of Matter

- 1. _____ is anything that has mass and volume.
- 2. The two states of matter that occupy a definite volume are _____ and _____.
- 3. _____ and _____ are the other two states of matter.
- 4. _____ changes alter the identity of a substance, whereas _____ changes do not.
- 5. What is the relationship between the kinetic energy of molecules and their physical state?

Identify whether each of the following changes is a physical change or a chemical change. Write a "P" on the line for a physical change and a "C" for a chemical change.

- _____ 1. water boiling
- _____ 2. iron rusting
- _____ 3. butter melting
- _____ 4. alcohol evaporating
- _____ 5. wood rotting
- _____ 6. leaves changing color
- _____ 7. glass breaking
- _____ 8. mowing the lawn
- _____ 9. magnetizing a nail
- _____ 10. baking a cake

State the Law of Conservation of Energy