
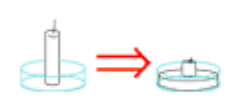
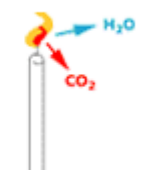


Properties of Matter

key concepts:

- Properties of **matter** can be divided into **quantitative** versus **qualitative**, **chemical** versus **physical**, and **intensive** versus **extensive**.
- Density is an intensive property that is a combination of two extensive properties.
- **Physical changes** do not alter the composition of a substance, while **chemical changes** do alter the composition of a substance.

<p>Physical properties</p> <table border="1"> <thead> <tr> <th>Quantitative Properties</th> <th>Qualitative Properties</th> </tr> </thead> <tbody> <tr> <td>mass</td> <td>color</td> </tr> <tr> <td>volume</td> <td>odor</td> </tr> <tr> <td>temperature</td> <td>taste</td> </tr> <tr> <td>melting point</td> <td></td> </tr> <tr> <td>boiling point</td> <td></td> </tr> </tbody> </table> <p>Chemical properties</p> <p>flammability water sensitivity/reactivity</p>	Quantitative Properties	Qualitative Properties	mass	color	volume	odor	temperature	taste	melting point		boiling point		<p>Properties of matter can be divided into quantitative versus qualitative, chemical versus physical, and intensive versus extensive.</p> <p>Quantitative properties (such as mass or volume) are described in terms of a number with units. Qualitative properties (such as color or odor) do not include a number.</p> <p>Chemical properties describe how a substance will react chemically. Physical properties can be observed or measured.</p>
Quantitative Properties	Qualitative Properties												
mass	color												
volume	odor												
temperature	taste												
melting point													
boiling point													
<p>Intensive properties</p> <p>density temperature boiling point color</p> <p><i>boils at 100°C</i> <i>boils at 100°C</i></p> <p>Density = $\frac{\text{mass}}{\text{volume}}$</p> <p>Extensive properties</p> <p>mass volume</p> 	<p>Intensive properties do not depend on the amount of a substance. For example, the boiling point of a small pot of water is the same as the boiling point of a large pot of water. Intensive properties can be used to identify substances.</p> <p>Extensive properties depend on the amount of a substance. For example, the mass of one "stuff model" is not the same as the mass of three "stuff models".</p> <p>Density is an intensive property, but is made up of two extensive properties (mass and volume). Since the density of a substance does not depend on how much of that substance is present, density can be used to distinguish between different substances.</p>												
<p>physical change</p> 	<p>chemical change</p>  <p>Physical changes do not alter the composition of a substance. For example, even if a candle is melted, it is still made of wax.</p> <p>Chemical changes alter the composition of a substance. For example, if a candle is burnt, the wax changes into carbon dioxide and water.</p>												