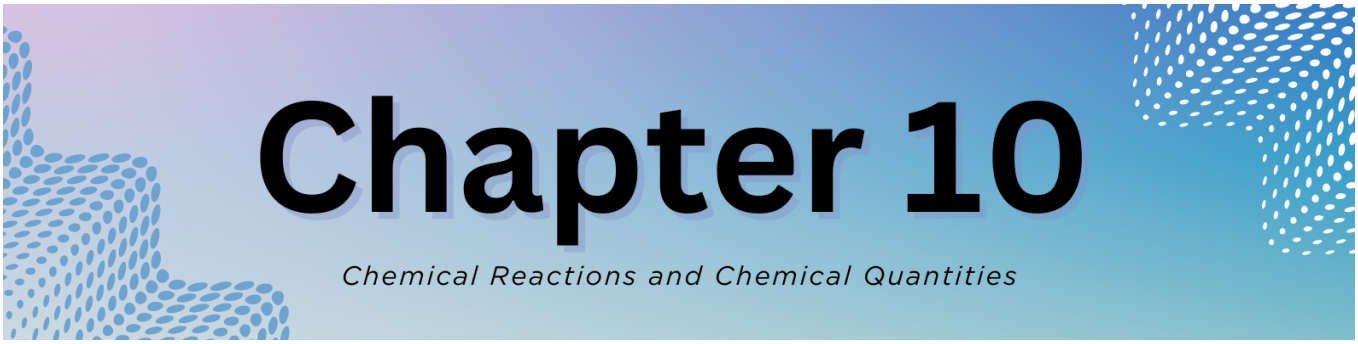
CHAPTER OVERVIEW

10: Chemical Reactions and Chemical Quantities



In this paragraph from the *Elements of Chemistry*, Antoine Lavoisier (1743–94) is explaining an experiment in which he was trying to demonstrate that water is not an element but instead is composed of hydrogen (the gas “capable of being burnt”) and oxygen. This is a historical account of a groundbreaking experiment and illustrates the importance of *amounts* in chemistry. Lavoisier was pointing out that the initial total mass of water and charcoal, 85.7 g plus 28 g, equals the final total mass of carbonic acid and the particular gas, 100 g plus 13.7 g. In this way, he was illustrating the law of conservation of matter - another way of saying that *amounts matter*.

Amounts do matter and in a variety of circumstances. For example, a nurse who mistakenly read “2–3 mg” as “23 mg” and administered the higher and potentially fatal dose of morphine to a child. Food scientists who work in test kitchens must keep track of specific amounts of ingredients as they develop new products for us to eat. Quality control technicians measure amounts of substances in manufactured products to ensure that the products meet company or government standards. Supermarkets routinely weigh meat and produce and charge consumers by the ounce or the pound.

In the lab, we look at changes in matter that deal with billions of atoms at a time. How can we keep track of so many atoms (and molecules) during the reaction process? In this chapter, we will be describing and quantifying chemical changes via **stoichiometry** - or "element counting".

5.01: Prelude to Introduction to Chemical Reactions

Chapter Sections

References

1. https://saylordotorg.github.io/text_...l-reactio.html

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