

Saladin 7E
Answer Key
Chapter 2, The Chemistry of Life

Testing Your Comprehension

1. The loss of stomach acid by profuse and prolonged vomiting raises the pH of the body fluids. When acid is lost from the body, surplus base remains and the pH rises.
2. As the carbon dioxide concentration in the body fluids drops, the carbonic acid reaction shifts in the following direction: $\text{H}_2\text{CO}_3 \rightarrow \text{H}_2\text{O} + \text{CO}_2$. The more CO_2 that is expelled (faster than it is produced), the less carbonic acid remains in the blood. With less carbonic acid, the blood pH rises, becoming more basic.
3. This is an exergonic reaction, because it releases energy in the form of the γ ray. It is neither an anabolic nor a catabolic reaction, however. These are branches of metabolism, and metabolism is the formation and breakdown of chemical bonds. No chemical bonds are formed or broken in radioactive decay.
4. The function of an enzyme is to speed up a chemical reaction. Without enzymes, the body's metabolic rate would therefore slow down drastically, to a point incapable of supporting life.
5. An abnormally low pH slows down enzymatic reactions and may even irreversibly denature enzymes. As enzyme conformations change, their active sites change and cannot bind their substrates. Metabolic pathways can then shut down.