Summary

Gluten is a heterogeneous mixture of proteins mainly gliadins and glutenins, with limited solubility in water. When mixed with water, gluten forms viscoelastic dough capable of entrapping gas during fermentation. Gliadin and glutenin are known to impart entirely different physical properties to the gluten network in dough. Gliadin behaves mainly as a viscous liquid when hydrated and imparts extensibility, allowing the dough to rise during fermentation, whereas glutenin provides elasticity and strength, preventing the dough from being over-extended and collapsing either during fermentation or in baking. Disulfide bonds play a key role in the formation and development of dough. They form strong cross-links within and between polypeptide chains, thereby stabilizing hydrogen bonds and hydrophobic interactions. During dough formation and development, disulfide bonds can be mobilized through disulfide-interchange reactions. The interchange reaction requires a mobile (soluble or low-molecular-weight) sulfhydryl-containing substance to initiate the series of disulfide interchanges resulting in extensive polymerization of gluten proteins.