Thermochemistry is the study of the energy and heat associated with chemical reactions and/or physical transformations. A reaction may release or absorb energy, and a phase change may do the same, such as in melting and boiling. Thermochemistry focuses on these energy changes, particularly on the system's energy exchange with its surroundings. Thermochemistry is useful in predicting reactant and product quantities throughout the course of a given reaction.

Chemical thermodynamics studies the nature of the role of entropy in the process of chemical reactions and provided the bulk of expansion and knowledge of the field. Other formulations of thermodynamics emerged in the following decades. The combination of enthalpy and entropy can be used to predict whether a reaction is spontaneous or non-spontaneous (i.e., favorable or unfavorable to occur). Statistical thermodynamics, or statistical mechanics, concerns itself with statistical predictions of the collective motion of particles from their microscopic behavior.