# CHAPTER OVERVIEW

## 5: Thermodynamic Potentials

This chapter begins with a discussion of mathematical properties of the total differential of a dependent variable. Three extensive state functions with dimensions of energy are introduced: enthalpy, Helmholtz energy, and Gibbs energy. These functions, together with internal energy, are called **thermodynamic potentials**. (The term *thermodynamic potential* should not be confused with the *chemical potential*, $\mu$, to be introduced in Sec. 5.2.) Some formal mathematical manipulations of the four thermodynamic potentials are described that lead to expressions for heat capacities, surface work, and criteria for spontaneity in closed systems.