Chapitre 1 :

1. Know the definition of a thermodynamic system.
2. Know the types of system according to the nature of the exchange.
3. Banker's convention (what is received + and given up -).
4. Microscopic variables (temperature and pressure, volume, quantity of matter, etc.).
5. Know the formula for pressure: P=F/S (P in Pa, F in N and S in m^2);
6. Convert Pa to atm or bar (1 atm=1bar = 10^5Pa).
7. Convert temperature from °C to K and vice versa.

   T(°C = T(K) – 273,15

   T(K) = T(°C) +273,15 .

8. Know the notion of state function and its properties. Know how to write the exact total differential of a state function as a function of its variables.
9. Know the equilibrium state where variables no longer vary with time.
10. Know the notion of transformation (passage from one state of equilibrium to another).
11. Know and manipulate the equation of state for perfect gases: **PV = nRT** (P in Pa, V in m3, T in K, n in mol, R=8.314 J/mol/K).
12. Know the characteristics of a perfect gas: particles are point-like, no interaction between particles, if there is a shock, it is elastic).
13. The real van der Waal gas: (particle volume and interaction between particles are taken into account by parameters a and b introduced into the equation).
14. Know the conditions without which a real gas can be considered perfect (high temperatures and low pressures).
15. Thermoplastic coefficients: Know how to demonstrate expressions for perfect gases.

($\alpha = \frac{1}{V}\left(\frac{\partial V}{\partial T}\right)_P = \frac{1}{T}$ $\beta = \frac{1}{P}\left(\frac{\partial P}{\partial T}\right)_V = \frac{1}{T}$ $\chi_T = -\frac{1}{P}\left(\frac{\partial V}{\partial P}\right)_T = \frac{1}{T}$).