

**Exercise 01 :**

The transition temperature from rhombohedral sulfur to monoclinic sulfur is 95.5°C under 1 atm.

-We are asked to calculate the free enthalpy variation of this transformation at a temperature of 25°C under 1 atm.

We give the entropy of the two forms of sulfur under the pressure of 1 atm as a function of the temperature in cal/K.mol as follow :

$$S_r = -14.61 + 3.58 \ln T + 6.24 * 10^{-3}T$$

$$S_m = -14.50 + 3.56 \ln T + 6.96 * 10^{-3}T$$

**Exercise 02 :**

Calculate the change in chemical potential of an ideal gas as the pressure increases isothermally from 92 KPa to 252KPa at 30°C.

The fugacity coefficient of a certain gas at temperature 300k and pressure 2.1MPa is 0.7.

-Calculate the difference in chemical potential of this gas with the potential of an ideal gas in the same state.

**Exercise03 :**

Study the effect of temperature on the chemical potential of liquid water during a temperature variation of 100 k

1-we assume constant the absolute molar entropy of liquid water between 298K and 398K

2-taking into account the dependence of absolute molar entropy on temperature