## 5. Exercise General Chemistry 26.11.2022

## WS 2022/23

### 5.1

Determine the enthalpy of vaporization and boiling point of 2,2,3-tribromopropane from the following vapor pressure data:

| $p$/Torr | 1 | 10 | 40 | 100 | 400 |
|---|---|---|---|---|---|
| $t$/°C | 38,2 | 79,8 | 111,8 | 136,3 | 182,8 |

### 5.2

A synthetic air may contain 60% by volume of $N_2$, 20% by volume of $O_2$ and 20% by volume of Ar. At 2 bar and 20 °C, this air is in equilibrium with water in terms of gas solubility. Use the data from the lecture to calculate the concentrations of $N_2$ and $O_2$ in water in g / 100 g water.

### 5.3

At 290K the vapour pressure of pure Benzene is 50 Torr, the vapour pressure of pure Toluene is 15 Torr. Which mixture of liquid Toluene/Benzene (which composition) will distill equimolar at 290K? What will be the total vapour pressure?

### 5.4

The boiling point of benzene is 80 °C. What is the vapor pressure of a solution at 80 °C containing 5 g of anthracene in 100 g of benzene?

### 5.5

Given is the phase diagram of sulfur. At what temperature does sulfur boil? At which pressures can you sublime sulfur? Which phases are formed by sulfur when heated at 0.01 bar? At what temperatures are the corresponding transformation points? How many triple points does the diagram have? For the triple point at the lowest temperature, name the phases in equilibrium. What are the highest temperatures at which monoclinic or rhombic sulfur are stable?