Homework 13

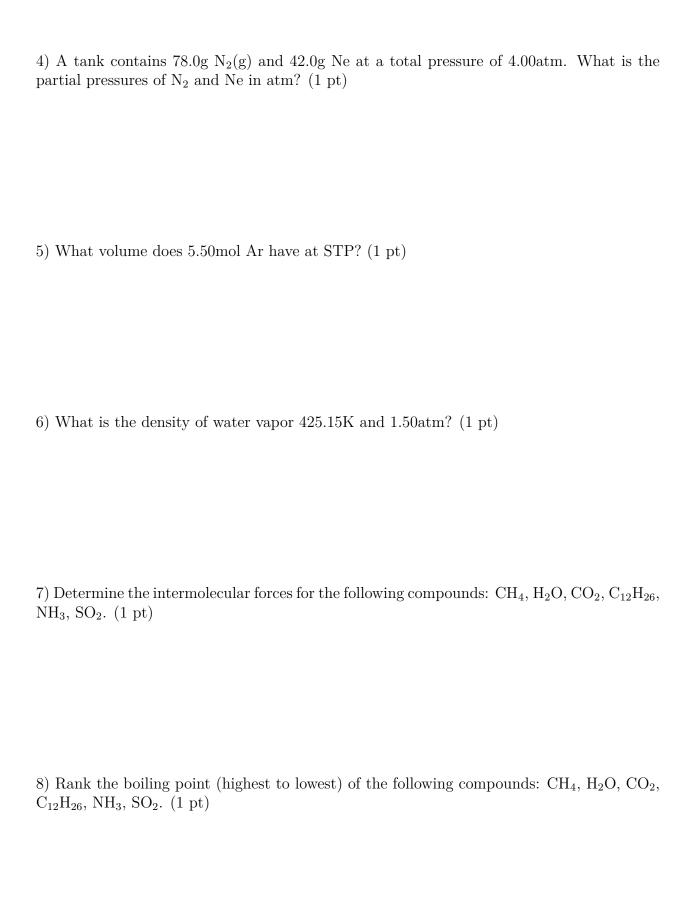
December 3, 2022

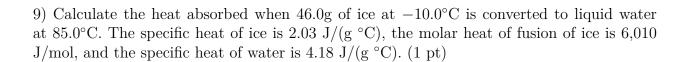
Weekly homework assignments are posted approximately one week prior to the due date. Collaborations are encouraged and students must report all collaborators in writing on each assignment. All external sources (websites, books) must be properly cited. Additional problems are listed at the end of each assignment. This week's assignment is due *Fri*, *Dec 9th at 11:59pm*.

1) A sample of helium gas at 298.15K and 1.03atm occupies a volume of 5.00L. How many moles of helium gas are there? (1 pt)

2) A scientist collect $CO_2(g)$ into a tank that contains a mixture of $N_2(g)$ and He(g). The total pressure is 5.45atm. Vapor pressures of $N_2(g)$ and He(g) are 1.20atm and 2.72atm, respectively. What is the partial pressure of $CO_2(g)$? (1 pt)

3) $N_2(g)$ is collected over $H_2O(g)$ at $40.0^{\circ}C$. What is the partial pressure of nitrogen if the total pressure is 99.42 kPa? The vapor pressure of $H_2O(g)$ at $40^{\circ}C$ is 7.38kPa. (1 pt)





- 10) Car air bags inflate based on the decomposition of sodium azide, $NaN_3(s)$:
- $2~NaN_3(s) \rightarrow 2~Na(s) + 3~N_2(g)$

What mass of NaN_3 is needed to fill a 3.50L air bag with nitrogen gas at a pressure of 1.50atm and 300.K?

Optional Textbook Problems: Ch. 9-9.15 - 9.101 odd; Ch. 10-10.31 - 10.79 odd