Answer on Question #78167, Chemistry / Organic Chemistry

Question:

A pressurized inflated tube at room temperature contains chlorine and hydrogen gases with masses 6 kg and 9 kg respectively. Given that the total pressure of the tube is 190 kPa, calculate:

a) the moles of "air" in the tube

b) the partial pressure of the gases

Solution:

Amount of chlorine: 6000 / 70.90 = 84.626 mol

Amount of hydrogen: 9000 / 2.016 = 4464.286 mol

Amount of "air":   84.626 + 4464.286 = 4548.912 mol

Molar part is equal to the partial pressure (for the mixture of gases), so:

Partial pressure of chlorine: (84.626 / 4548.912) · 190 = 3.535 kPa

Partial pressure of hydrogen: (4464.286 / 4548.912) · 190 = 186.465 kPa

Answer:

a)

Amount of "air": 4548.912 mol

b)

Partial pressure of chlorine: 3.535 kPa

Partial pressure of hydrogen: 186.465 kPa