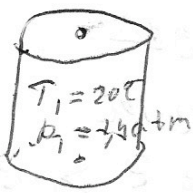
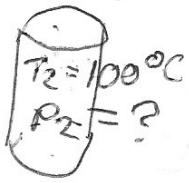
FAFA30 4.8





$\Delta p = p_2 - p_1 = 0,38$

Start
$T_1 = 20°C$
$p_1 = 1,4$ atm

Slut
$T_2 = 100°C$
$p_2 = ?$

$$pV = nRT \Leftrightarrow \frac{p}{T} = \frac{nR}{V} = k$$

$$\frac{p_1}{T_1} = \frac{p_2}{T_2} \Leftrightarrow p_2 = \frac{p_1 T_2}{T_1}$$

$$\Delta p = \frac{p_1 T_2}{T_1} - p_1 = \frac{p_1 T_2 - p_1 T_1}{T_1} = \frac{p_1 (T_2 - T_1)}{T_1} =$$

$$\frac{1,4 \text{ atm } (80) K}{293 K} = 0,38 \text{ atm}$$

4.20

Kvell

$T_1 = 30°C$

$RF_1 = 59\%$

Morgan

$T_2 = 20°C$

$RF_2 = ?$ > 100%

~~Anton~~

$RF_2 > 100\%$?

$$R_{LF} = \frac{p_{vatten}}{p_{mättnad}} \Leftrightarrow p_{vatten} = R_{LF} \cdot p_{mättnad}$$

$p_{mättnad,\ 30°C} = 4,24\ kPa$

$p_{mättnad\ 20°C} = 2,34\ kPa$

} Tab s. 364

$p_{vatten,\ kvall} = 0,59 \cdot 4,24\ kPa = 2,50\ kPa$

$2,50\ kPa > 2,34\ kPa \Rightarrow$ ~~4~~kondensering

4.21

Ute	Bark
$T = 40°C$	$T = ?$
$\varphi_{LF} = 3,5\%$	

Hvilken temp på bark for kondens?

$$\varphi_{LF} = \frac{p_{ratten}}{p_{mättnad}} \Leftrightarrow p_{ratten} = \varphi_{LF} \cdot p_{mättnad}$$

$p_{mättnad, 40°C} = 7,37$ kPa

$p_{ratten} = 0,035 \cdot 7,37 = 0,25795 \approx 0,258$ kPa

$p_{mättnad} = 0,258$ kPa, $T = ?$

$T \approx -10°C$

4.28

Mört bil, sluta accelerera. Varför?

$pV = nRT \Leftrightarrow \frac{p}{T} = \frac{nR}{V}$

$\frac{p_1}{T_1} = \frac{p_2}{T_2}$ 

$\frac{p_1}{p_2} = \frac{T_1}{T_2}$ $\quad T_2 > T_1 \Rightarrow p_2 > p_1.$

122 100 g H_2 ; n = 4 u

T = 300 K

t = 1,0 s

strecken de rört sig?

1 ljusår är $9461 \cdot 10^{12}$ km = $9461 \cdot 10^{15}$ m

En partikel H_2:

$\langle v \rangle = \sqrt{\frac{8kT}{\pi m_{en}}} = 1260$ m/s $m_{en} = 2 \cdot 4\,u = 8u \cdot 1{,}66 \cdot 10^{-27}$ kg, $1{,}66 \cdot 10^{-27}$

Antal partiklar H_2 i 100 g

$N = \frac{m_{tot}}{m_{en}} = \frac{0{,}100\ kg}{2 \cdot 4{,}0026\ u} =$

$= 1{,}50 \cdot 10^{25}$ st

$k = \frac{R}{N_A}$

$k = 1{,}3807 \cdot 10^{-23}$ J/K

$1260\ m/s \cdot \frac{0{,}100\ kg}{2 \cdot 4{,}0026 \cdot 1{,}66 \cdot 10^{-27}\ kg} \cdot \frac{1}{1\ sekund} = 2{,}00 \cdot 10^{12}$ ljusår

$= 1{,}50 \cdot 10^{25}$