Massa Atmosfera

$$101325\,Pa = \frac{F}{A} = \frac{101325\,N}{m^2} = mg$$

$$\frac{101325\,N}{9{,}81\,\frac{m}{s^2}} = 10328\,kg$$

em $1\,m^2$ → 10328 kg.

$$4\pi \cdot (6371\,km)^2 \simeq 5 \times 10^{14}\,m^2$$

$$M_{ATM} = 5 \times 10^{14}\,m^2 \cdot 10^4\,\frac{kg}{m^2} \simeq 5 \times 10^{18}\,kg$$

$2{,}5 \times 10^{13}\,kg$

$$Q = m \cdot c_v \cdot \Delta T$$

5×10^{18} ↑ 3R 2°C.

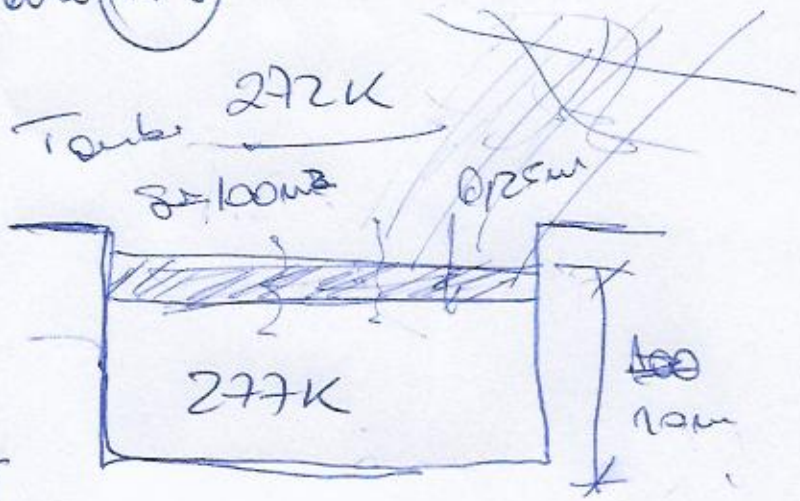
$$5 \times 10^{18}\,kg \cdot \frac{3 \cdot 8{,}314\,J}{mol\,K} \cdot 2K$$

$10^{22}\,J$

14 — 7
8 — 4
18 — 9

6 — 3

Problema 8.15



$m C_v dT$

$$\frac{dQ}{dt} = h A (T_c - T_f) \quad \text{gral}$$

$$\frac{dQ}{dt} = \left(\frac{k}{d}\right) \cdot A (T_c - T_f) \text{ - conducción.}$$

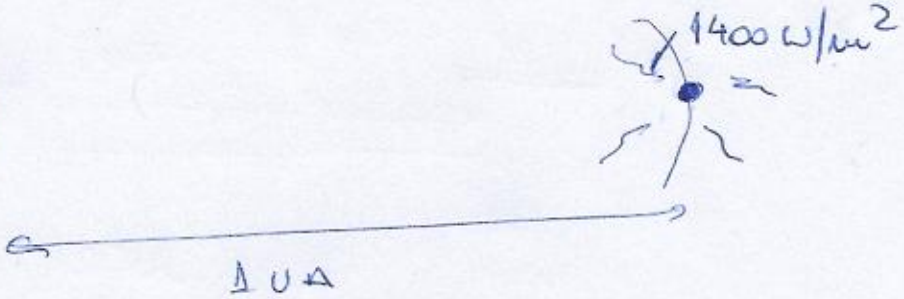
$$T(t) = T_{amb} + (T_d(0) - T_{amb}) e^{-t/\tau}$$

$$\tau = \frac{m C_v}{h A} \qquad h = \frac{k}{d}$$

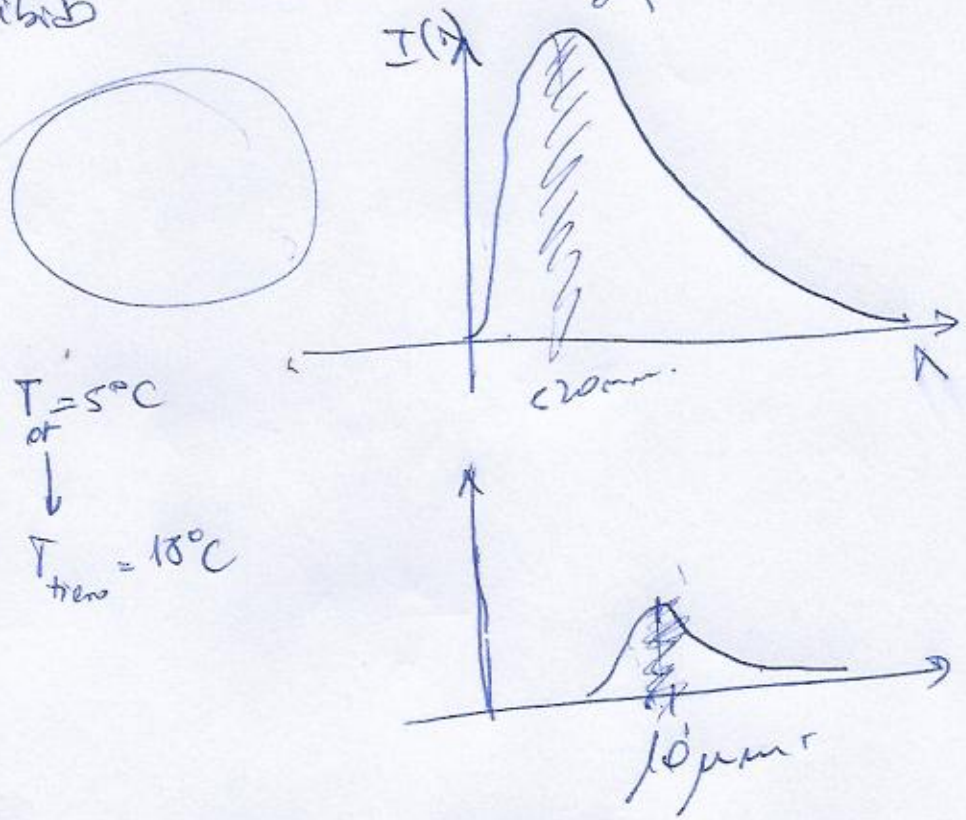
$$\tau = \frac{M C_v d}{k \cdot A} = \frac{10^5 \text{ kg} \cdot 4184 \frac{J}{kg K} \cdot 0{,}25 m}{2{,}40 \frac{J}{m s K} \cdot 100 m^2 \cdot 1}$$

$$\tau = 5.230000 \text{ s} = 60{,}53 \text{ d}.$$

Sol



$E_{Recibida} = E_{emitida}$, Sol

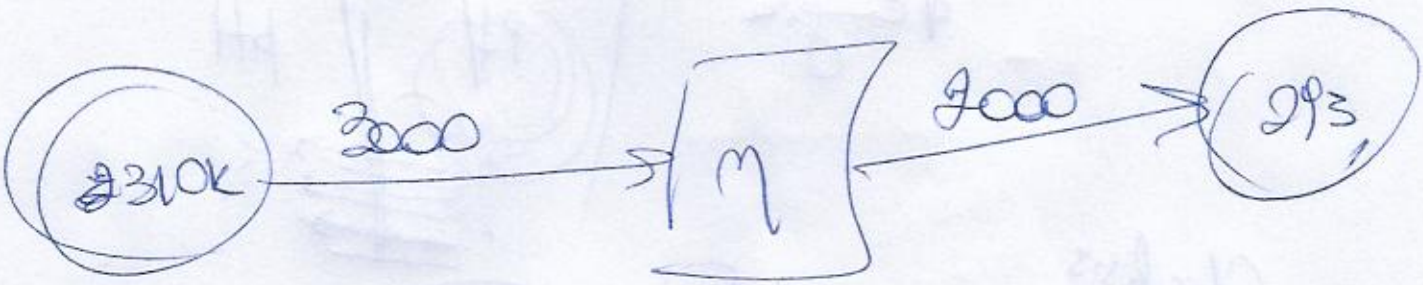


$Q = 3000\ kcal$.

CG.
AT.

$Q_{Barol} = 2000\ kcal$

$W = 1000\ kcal$



1000.

irreversible

$\eta = 33\%$.

$37°C = 310K$. $293K$

$\eta = 1 - \frac{T_f}{T_c} = 1 - \frac{293}{310}$

$\eta = 5{,}49\%$

$E_p = mgh$

$m = 70\ kg$.

$g = 9{,}8\ \frac{m}{s^2}$

$70kg \cdot 9{,}8\frac{m}{s^2} \cdot 500m =$

$82\ kcal$ $343kJ$. (3)

ADP → ATP

Energie

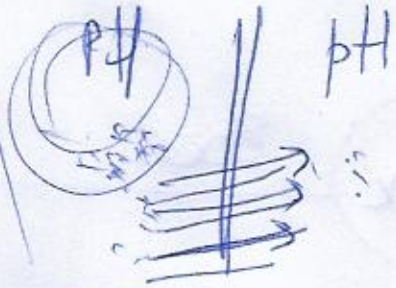
ATP → ADP

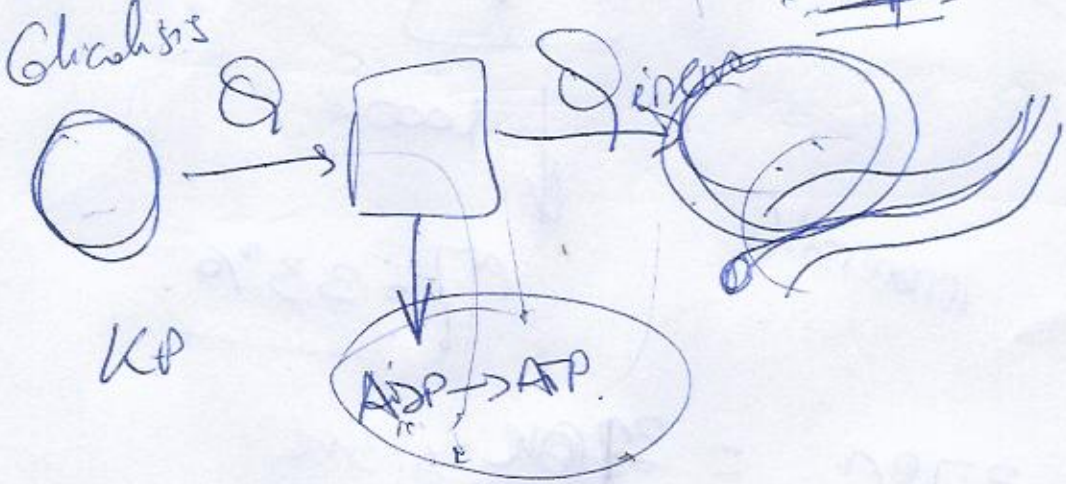
Energie

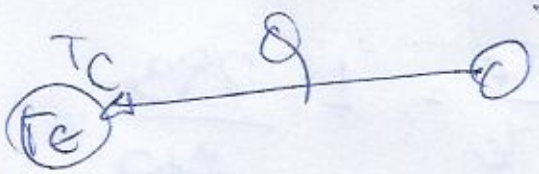
$-\log_{10}[H]$

↓

pH

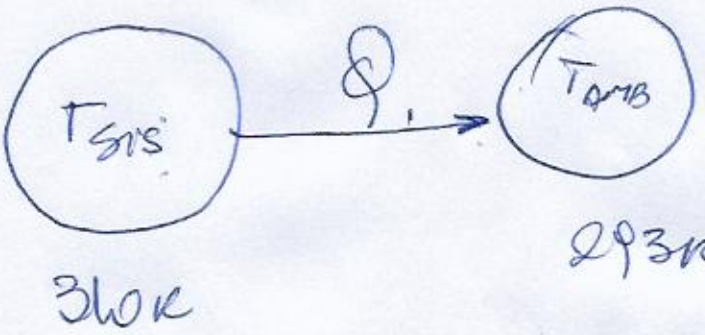






ATP → Q

hω



310K

293K

$$\Delta S_U = \Delta S_{SYS} + \Delta S_{AMB}$$

$$= \frac{-q}{T_{SYS}} + \frac{q}{T_{AMB}} \qquad q = 150\,\frac{J}{s}$$

$$\downarrow$$

$$q = 150\,J$$

$$= \frac{-150\,J}{310K} + \frac{150\,J}{293K}$$

$$= +0.03\,\frac{J}{K}$$ cada segundo.