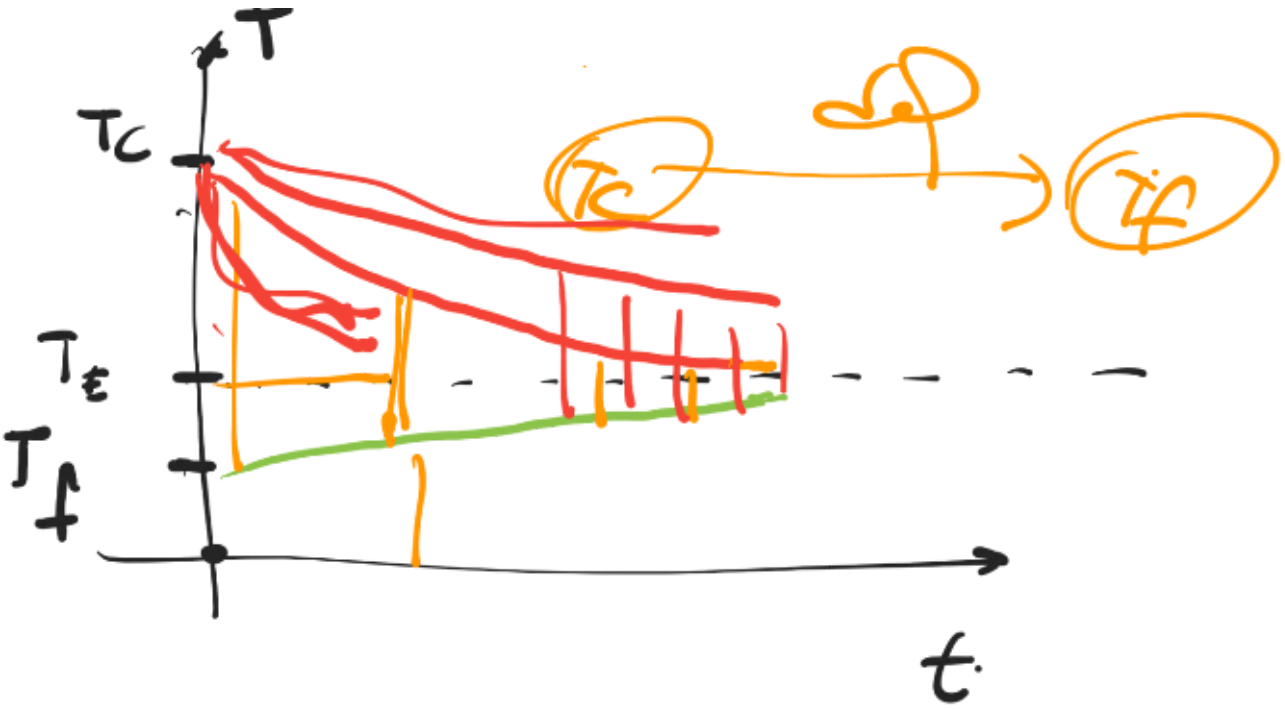
f3b-20190530-U04C01-ley-de-Newton



$\frac{dQ}{dt} \propto$ → dif temperatura
⇒ Material presente en el medio.
→ Cat. de materia.
→ material de cada fuente
→ Distancia
→ Área de contacto
→ Objeto

→ Superficie ✓

$$\frac{dQ}{dt} \propto A\,(T_c - T_f)$$

$$\frac{dQ}{dt} = -h\,A\,(T_c - T_f)$$

[Coef. de transf de calor

$$[h] = \frac{J}{s\,m^2\,K}$$

$$\frac{dQ}{dt} = -h\,A\,(T_c - T_f)$$

$$dQ = m\,C_v\,dT \cdot \frac{dt}{dt}$$

$$\frac{dQ}{dt} = m C_v \frac{dT}{dt} = -hA\,(T_c - T_f)$$

$$\frac{dT}{dt} = -\frac{hA}{m C_v}\,(T_c - T_f)$$

$$\frac{dT}{dt} = -\left(\frac{hA}{m C_v}\right) \cdot \left(T(t) - T_f\right)$$

$$\frac{dT_f}{dt} c + \left(\frac{hA}{m_f C_f}\right)\left(T(t) - T_f(t)\right)$$

$$\frac{dT}{dt} = -\left(\frac{hA}{m C_v}\right)\left(T(t) - T_f\right)$$

$$T_f = T_{amb} = cte$$

$$\frac{dT}{dt} = -\left(\frac{hA}{m C_v}\right)\left(T - T_{amb}\right)$$

$$r$$

$$[r] = \frac{\cancel{J}}{\cancel{s}\,\cancel{m^2}\,\cancel{K}\,\cancel{kg}\,\frac{\cancel{J}}{\cancel{kg}\,\cancel{K}}} = \frac{1}{s}$$

$$\frac{dT}{dt} = -r\,(T - T_f)$$

$$\frac{dT}{dt} = -rT + rT_f$$

$$\frac{dT}{dt} = -r\,(T - T_f)$$

$$\frac{dT}{dt} - \frac{dT_f}{dt} = -r\,(T - T_f)$$

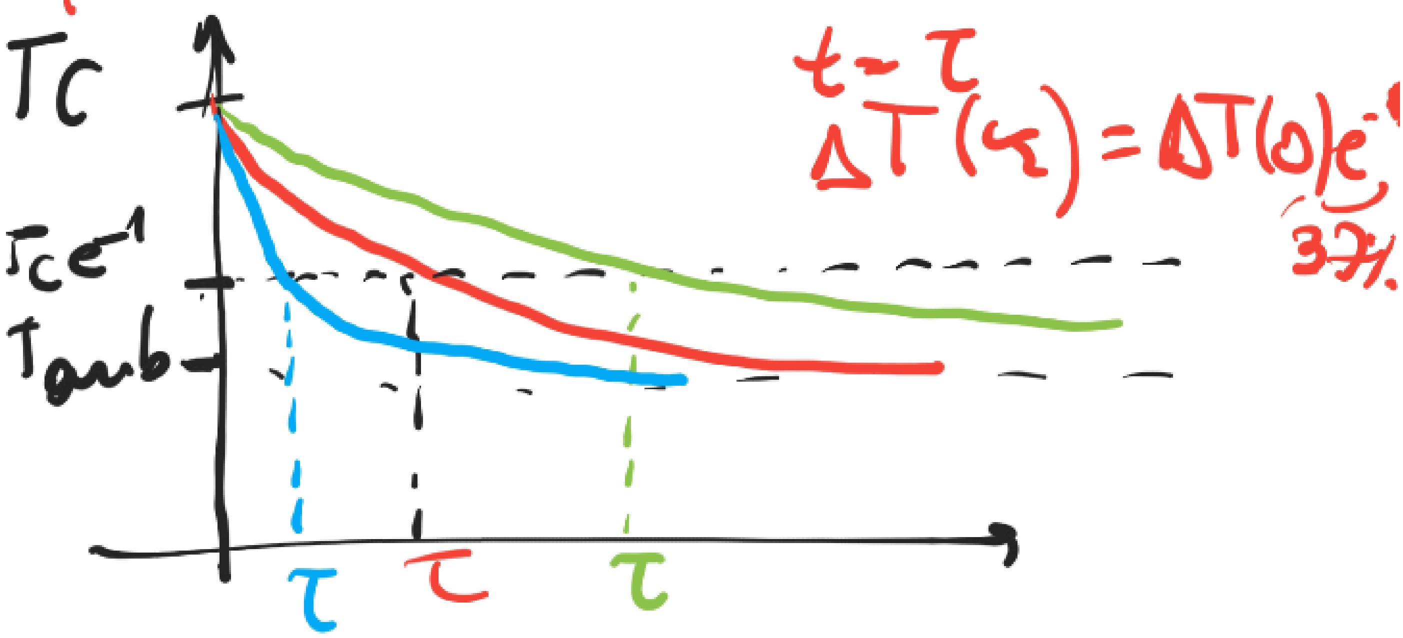
$$\frac{d}{dt}\underbrace{(T - T_f)}_{\Delta T} = -r\,(T - T_f)$$

$$\frac{d\,\Delta T}{dt} = -r\,\Delta T(t)$$

$$\Delta T(t) = \Delta T(0)\,e^{-rt}$$

$$\tau = \frac{1}{r} \Rightarrow [\tau] = s.$$

$$\boxed{\Delta T = \Delta T(0)\,e^{-t/\tau}}$$



Como Esfriamento da

Última modificación: 19:56