4,12V

$1,6 \times 10^{-19}$ → 1eV

1) Datos

$F = \frac{c}{\lambda}$

$E = h \cdot F$

$\lambda_1 = 360nm$ 12:00

$\lambda_2 = 310\ nm$ 13:00

$\lambda_3 = 280nm$ 14:00

$F_1 = \frac{3 \times 10^8\ m/s}{360 \times 10^{-9}\ m} = 8,33 \times 10^{14}\ s$

$E_1 = 6,62 \times 10^{-34}\ J.s \cdot 8,33 \times 10^{14}\ s = 5,51 \times 10^{-19}\ J$

$5,51 \times 10^{-19}\ J = \boxed{3,44\ eV}$

$F_2 = \frac{3 \times 10^8\ m/s}{310 \times 10^{-9}\ m} = 9,67 \times 10^{14}\ s$

$E_2 = 6,62 \times 10^{-34}\ J.s \times 9,67 \times 10^{14}\ s = 6,40 \times 10^{-19}\ J$

$6,40 \times 10^{-19}\ J = 4,0\ eV$

$F_3 = \frac{3 \times 10^8\ m/s}{280 \times 10^{-9}\ m} = 1,07 \times 10^{15}\ s$

$E = 1,07 \times 10^{15}\ s \cdot 6,62 \times 10^{-34}\ J.s = 7,08 \times 10^{-19}$

$7,08 \times 10^{-19} = \boxed{4,42\ eV}$ solucion.

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2) Datos

$E = h \cdot F$ $1\ eV = 1,28 \times 10^{-18}\ J$

$E = 8\ eV$

$E = 1,28 \times 10^{-18}\ J$

$\lambda = ?$

$F = ?$

$\frac{1,28 \times 10^{-18}\ J}{6,62 \times 10^{-34}\ J.s} = \boxed{1,93 \times 10^{15}\ s^{-1}}$

$\lambda = \frac{3 \times 10^8\ m/s}{1,93 \times 10^{15}\ \frac{1}{s}} = \boxed{1,55 \times 10^{-7}\ m}$

$V = \lambda \cdot F = 1,55 \times 10^{-7}\ m \times 1,93 \times 10^{15}\ \frac{1}{s} = \boxed{299150000}$

NOTA

100% → 3×10^8 m/s

99,71% = 70 ← 299150000

porcentaje de la velocidad de la luz

3) Datos

U.V.A = 315 nm ; 400 nm $U.V.A_{Prom} = \frac{315 + 400}{2} = 357,5$ nm

U.V.B = 280 nm ; 315 nm $U.V.B_{Prom} = 297,5$ nm

U.V.C = 100 nm ; 280 nm U.V.C = 190 nm

$F_1 = \frac{c}{\lambda} = 8,40 \times 10^{14}$ s $\mathcal{E} = 6,62 \times 10^{-34}$ J.s x $8,40 \times 10^{14}$ 1/s

$\mathcal{E} = 5,56 \times 10^{-19}$ J

$5,56 \times 10^{-19} = 3,47$ eV

$U = F \cdot \lambda \Rightarrow 299,88 \times 10^6$ m/s

$F_2 = \frac{3 \times 10^8 \text{ m/s}}{297,5 \times 10^{-9} \text{ m}} = 1,01 \times 10^{15}$ s

$\mathcal{E} = 6,68 \times 10^{-19}$ J = 4,17 eV

$U = F \cdot \lambda = 1,01 \times 10^{15}$ s $\cdot 297,5 \times 10^{-9}$ m

U = 300475000 m/s

$F_3 = \frac{3 \times 10^8 \text{ m/s}}{190 \times 10^{-9} \text{ m}} = 1,57 \times 10^{15}$ s

$\mathcal{E} = 6,62 \times 10^{-34}$ J.s $\cdot 1,57 \times 10^{15}$ s

$\mathcal{E} = 1,03 \times 10^{-18}$ J = 6,49 eV

$U = 1,5 \times 10^{15}$ s x 190 x 10^{-9} m = 285000000

NOTA

Datos

$\lambda_0 = 400\,nm$ $\quad \lambda = 3200\,\text{Å}$

HOJA N°

FECHA

4) $E = h \cdot \frac{c}{\lambda}$ $\qquad E = W_0 + K_{e^-}$

$E = 6{,}62 \times 10^{-34}\,Js \cdot \frac{3 \times 10^8\,m/s}{3200 \times 10^{-10}\,m}$

$E = 6{,}20 \times 10^{-19}\,J = \boxed{3{,}87\,eV}$

$W_0 = h \cdot \frac{c}{\lambda_0}$

$W_0 = 6{,}62 \times 10^{-34}\,Js \cdot \frac{3 \times 10^8\,m/s}{400 \times 10^{-9}\,m}$

$W_0 = 4{,}95 \times 10^{-19}\,J$

$W_0 = \boxed{3{,}1\,eV}$

$E = W_0 + K_{e^-}$

$3{,}87\,eV = 3{,}1\,eV + K_{e^-}$

$\frac{3{,}87\,eV}{3{,}1\,eV} = K_{e^-}$

$\boxed{K_{e^-} = 1{,}24\,Js}$

$\Delta V = \frac{1{,}24\,Js}{1{,}6 \times 10^{-19}\,C}$

$\boxed{\Delta = 7{,}75 \times 10^{18}\,V}$

$\lambda = \frac{6{,}62 \times 10^{-34}\,Js}{\sqrt{2 \cdot 9{,}1 \times 10^{-31}\,Kg \cdot 1{,}24\,Js}}$

$\lambda = \frac{h}{\sqrt{2 \cdot 9{,}1 \times 10^{-31}\,Kg \cdot 1{,}24\,Kg\frac{m^2}{s^2}}}$

$\lambda = \frac{h}{1{,}82 \times 10^{-30}\,Kg \cdot 1{,}24\,Kg\frac{m^2}{s^2}}$

$\lambda = \frac{h}{\sqrt{2{,}25 \times 10^{-30}\,Kg^2\frac{m^2}{s^2}}}$

$\lambda = \frac{h}{1{,}5 \times 10^{-15}\,Kg\frac{m}{s}}$

$\lambda = \frac{6{,}62 \times 10^{-34}\,\cancel{Kg}\,\frac{\cancel{m^2}}{\cancel{s^2}} \cdot \cancel{s}}{1{,}6 \times 10^{-15}\,\cancel{Kg}\,\cancel{m}\,\frac{\cancel{m}}{\cancel{s}}} = 4{,}13 \times 10^{-19}$

NOTA

5- $\mathcal{E} = \omega_0 + K_{e^-}$ $\quad \omega_0 = h \cdot f_0$

$h \cdot f = h \cdot \frac{c}{\lambda_0} + \frac{1}{2} m_e \cdot v^2$ $\quad \mathcal{E} = h \cdot F$

$\omega_0 = h \cdot \frac{c}{\lambda_0}$

Datos

$\lambda_0 = 750nm$ $\quad F = 5 \times 10^{14} Hz$

$f_0 = ?$ $\quad V_{e^-} = ?$

$\omega_0 = ?$

$\mathcal{E} = 6{,}62 \times 10^{-34} J.\cancel{s} \cdot 5 \times 10^{14} \frac{1}{\cancel{s}}$

$\mathcal{E} = 3{,}31 \times 10^{-19} J = 2{,}06 \, eV$

$3{,}31 \times 10^{-19} J = 6{,}62 \times 10^{-34} J.\cancel{s} \cdot \frac{3 \times 10^8 \, m/\cancel{s}}{750 \times 10^{-9} \cancel{m}} + \frac{1}{2} 9{,}1 \times 10^{-31} Kg \cdot v^2$

$3{,}31 \times 10^{-19} J = \boxed{2{,}64 \times 10^{-19} J} + 4{,}55 \times 10^{-31} Kg \cdot v^2$

$3{,}31 \times 10^{-19} J - 2{,}64 \times 10^{-19} J = 4{,}55 \times 10^{-31} Kg \cdot v^2$

$\frac{6{,}7 \times 10^{-20} J}{4{,}55 \times 10^{-31} Kg} = v^2$

$\sqrt{1{,}47 \times 10^{11} \frac{m^2}{s^2}} = v$

$\boxed{v = 383735 \, m/s}$

$\omega_0 = 6{,}62 \times 10^{-34} J.\cancel{s} \cdot \frac{3 \times 10^8 \, m/\cancel{s}}{750 \times 10^{-9} \cancel{m}} = 2{,}64 \times 10^{-19} s$

$f_0 = \frac{2{,}64 \times 10^{-19} J}{6{,}64 \times 10^{-34} J.s}$

$\boxed{f_0 = 3{,}99 \cdot s}$

$\lambda = \frac{h}{m.v}$ de Debroglie

6). Datos

$\omega_0 = 1,3eV$ $\lambda = 662nm$ $\lambda = \frac{c}{f}$

$K = \frac{1}{2} m.v^2$ $f = \frac{c}{\lambda}$

$f = \frac{3 \times 10^8 m/s}{662 \times 10^{-9} m} = 4,53 \times 10^{14} \frac{1}{s}$

$E = \omega_0 + K_{e^-}$

$K_{e^-} = 2,08 \times 10^{-19} J + 2,9 \times 10^{-19} J$

$K_{e^-} = 9,18 \times 10^{-20} J$ ← ones

$E = 6,62 \times 10^{-34} J.s \cdot 4,53 \times 10^{14} \frac{1}{s}$

$E = 2,9 \times 10^{-19} J$

$1,6 \times 10^{-19} J \rightarrow 1eV$

$2,08 \times 10^{-19} = x \leftarrow 1,3eV$

$9,18 \times 10^{-20} J = \frac{1}{2} 9,1 \times 10^{-31} Kg . v^2$

$9,18 \times 10^{-20} J = 4,5 \times 10^{-31} Kg . v^2$

$\frac{9,18 \times 10^{-20}}{4,5 \times 10^{-31}} = v^2$

$2,04 \times 10^{11} \frac{m^2}{s^2} = v^2$

$v = 451663 m/s$

$\lambda = \frac{6,62 \times 10^{-34} J.s}{9,1 \times 10^{-31} Kg . 451663 m/s}$

$\lambda = \frac{6,62 \times 10^{-34} J.s}{4,1 \times 10^{-25} Kg\ m/s}$

$\lambda = \frac{6,62 \times 10^{-34} Kg \frac{m^2}{s^2} . s}{4,1 \times 10^{-25} Kg\ m}$

$\lambda = 1,62 \times 10^{-9} m$ → Longitud de onda de los electrones emitidos

7)-

$T_1 = 27°$

$T_2 = 2 . T_1$

$A = 1 m^2$

$K° = °C + 273,15$

$P_1 > P_2$

$P = e \sigma . A . t^4$

$P_1 = 1 . 5,67 \times 10^{-8} \frac{W}{m^2 K^4} . 1 m^2 . t^4$

$P_1 = 5,67 \times 10^{-8} \frac{W}{K^4} . (300 K)^4$

$P_1 = 459,27 W$

$P_2 = 5,67 \times 10^{-8} . (321 K)^4$

$P_2 = 648,29 W$

8) Datos

$\phi = 20\,cm = 0{,}2\,m$ $\quad T = 500\,°K$ $\quad P_0 = 4\pi r^2$

1)- $P = e \cdot \sigma \cdot A \cdot T^4$

$P = 1.5{,}67 \times 10^{-8} \frac{w}{m^2 K^4} \cdot 0{,}50\,m^2 \cdot (500\,°K)^4$

$P = 2{,}83 \times 10^{-8} w \cdot (500)^4$

$\boxed{P = 1771{,}87\,w} \rightarrow e = 1$

2)- $P = 0{,}82 \cdot 5{,}67 \times 10^{-8} \frac{w}{m^2 K^4} \cdot 0{,}50\,m^2 \cdot (500\,°K)^4$

$\boxed{P = 1452\,w} \rightarrow e = 0{,}82$

3)- $P = 0{,}5 \cdot 5{,}67 \times 10^{-8} \frac{w}{m^2 K^4} 0{,}50\,m^2 \cdot (500\,°K)^4$

$\boxed{P = 885{,}93\,w} \rightarrow e = 0{,}5$

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9)- Datos

$f = 750 \times 10^{12}\,hz$

$\lambda_0 = 600\,nm$

$f > f_0 \rightarrow$ si EF

$\vec{v} = \frac{K_e}{q e^-}$ $\qquad E = h \cdot f$

$K = \frac{1}{2} m \cdot v^2$ $\qquad \lambda = \frac{c}{f}$

$W_0 = h \cdot f_0$

$W_0 = h \cdot f_0$ $\qquad E = W_0 + K_e$

$W_0 = 6{,}62 \times 10^{-34}\,J.s \cdot 5 \times 10^{15} \frac{1}{s}$

$f_0 = \frac{c}{\lambda_0} \Rightarrow \frac{3 \times 10^9\,m/s}{600 \times 10^{-9}\,m}$

$\boxed{f_0 = 5 \times 10^{15}\,\frac{1}{s}}$

$\boxed{W_0 = 3{,}31 \times 10^{-19}\,J}$

$E = 6{,}62 \times 10^{-34}\,Js \cdot 750 \times 10^{12}\,\frac{1}{s}$

$\boxed{E = 4{,}96 \times 10^{-19}\,J}$

$\Delta V = \frac{K}{q_e} \Rightarrow \Delta V = \frac{1{,}65 \times 10^{-19}\,J}{1{,}6 \times 10^{-19}\,C}$

$\boxed{\Delta V = 1{,}9\,V}$

$K_e = -3{,}31 \times 10^{-19}\,J + 4{,}96 \times 10^{-19}\,J$

$\boxed{K_e = 1{,}65 \times 10^{-19}\,J}$

NOTA