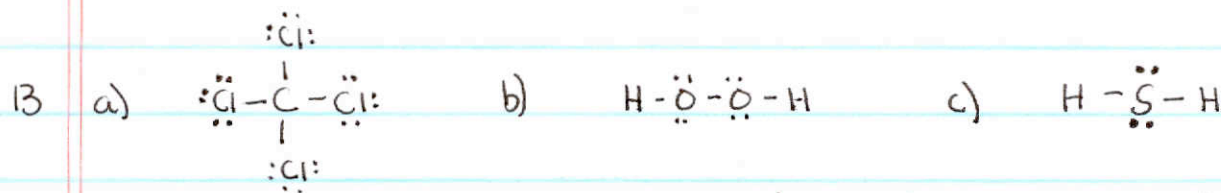


Chapter 2 + 3: homework (Homework #5)



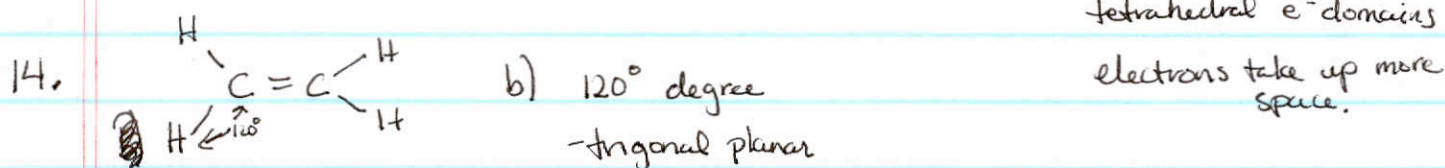
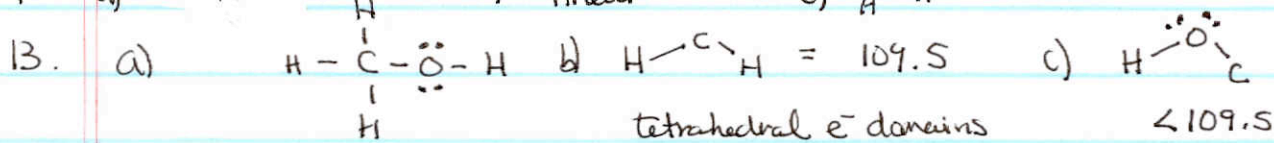
17 a)  $v = \frac{c}{\lambda} = \frac{3 \times 10^8 \text{ m/s}}{2.0 \times 10^{-2} \text{ m}} = 1.5 \times 10^{10} \text{ s}^{-1}$  18) a)  $E = h\nu = (6.63 \times 10^{-34} \text{ J}\cdot\text{s})(1.5 \times 10^{10} \text{ s}^{-1})$   
 $E = 9.95 \times 10^{-24}$

b)  $v = \frac{c}{\lambda} = \frac{3 \times 10^8 \text{ m/s}}{400 \times 10^{-9} \text{ m}} = 7.5 \times 10^{14} \text{ s}^{-1}$  b)  $E = (6.63 \times 10^{-34} \text{ J}\cdot\text{s})(7.5 \times 10^{14} \text{ s}^{-1})$   
 $E = 4.98 \times 10^{-19} \text{ J}$

c)  $v = \frac{c}{\lambda} = \frac{3 \times 10^8 \text{ m/s}}{50 \times 10^{-6} \text{ m}} = 6.0 \times 10^{12} \text{ s}^{-1}$  c)  $E = (6.63 \times 10^{-34} \text{ J}\cdot\text{s})(6.0 \times 10^{12} \text{ s}^{-1})$   
 $E = 3.99 \times 10^{-21} \text{ J}$

d)  $v = \frac{c}{\lambda} = \frac{3 \times 10^8 \text{ m/s}}{150 \times 10^{-3} \text{ m}} = 2.0 \times 10^9 \text{ s}^{-1}$  d)  $E = (6.63 \times 10^{-34} \text{ J}\cdot\text{s})(2.0 \times 10^9 \text{ s}^{-1})$   
 $E = 1.33 \times 10^{-24} \text{ J}$

20.  $\lambda = \frac{c}{\nu} = \frac{3 \times 10^8 \text{ m/s}}{2.45 \times 10^9 \text{ s}^{-1}} = 1.22 \times 10^{-1} \text{ m}$



17.  $E = h\nu = \frac{hc}{\lambda} = \frac{(6.63 \times 10^{-34} \text{ J}\cdot\text{s})(3 \times 10^8 \text{ m/s})}{4.26 \times 10^{-6} \text{ m}} = 4.67 \times 10^{-20} \text{ J}$

$E = h\nu = \frac{hc}{\lambda} = \frac{(6.63 \times 10^{-34} \text{ J}\cdot\text{s})(3 \times 10^8 \text{ m/s})}{15 \times 10^{-6} \text{ m}} = 1.33 \times 10^{-20} \text{ J}$