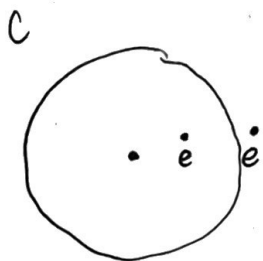
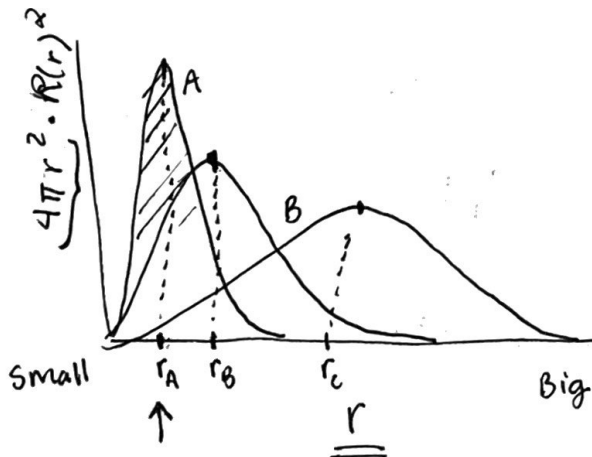
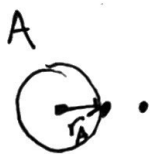
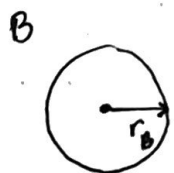


Homework 5 Questions

Problem # 8

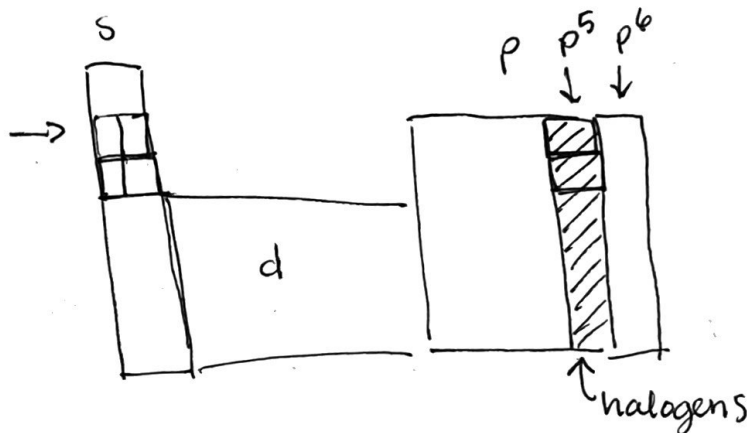
H and He⁺



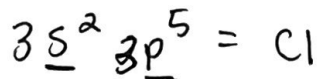
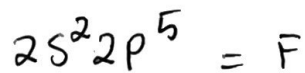
1s

Problem # 18

Halogen



Valence = last shell



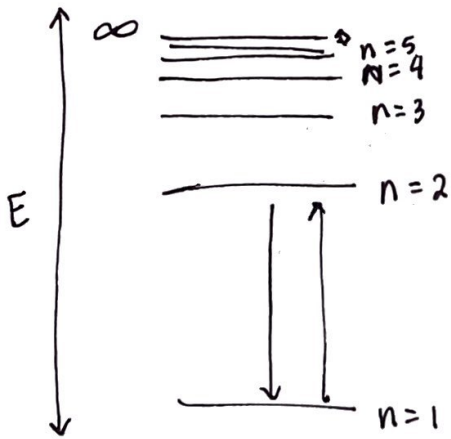
n = row # of periodic table



n = quantum #

Problem #4

n_1 and n_2



$$\nu = \frac{1}{\lambda} = R \left(\frac{1}{(n_i)^2} - \frac{1}{(n_f)^2} \right)$$

↑
longest wavelength

small $\lambda = \text{large}$

Big Jump, High Energy \Rightarrow Short wavelength

\rightarrow Small Jump, small Energy \Rightarrow long wavelength

High ν

low ν

Problem #5

$$n = 4$$

$$n = 2$$

$$\underline{1.09 \times 10^7 \frac{\text{m}}{\text{s}}}$$

Rydberg Formula

$$\nu = \frac{1}{\lambda} = R \left(\frac{1}{(n_i)^2} - \frac{1}{(n_f)^2} \right)$$

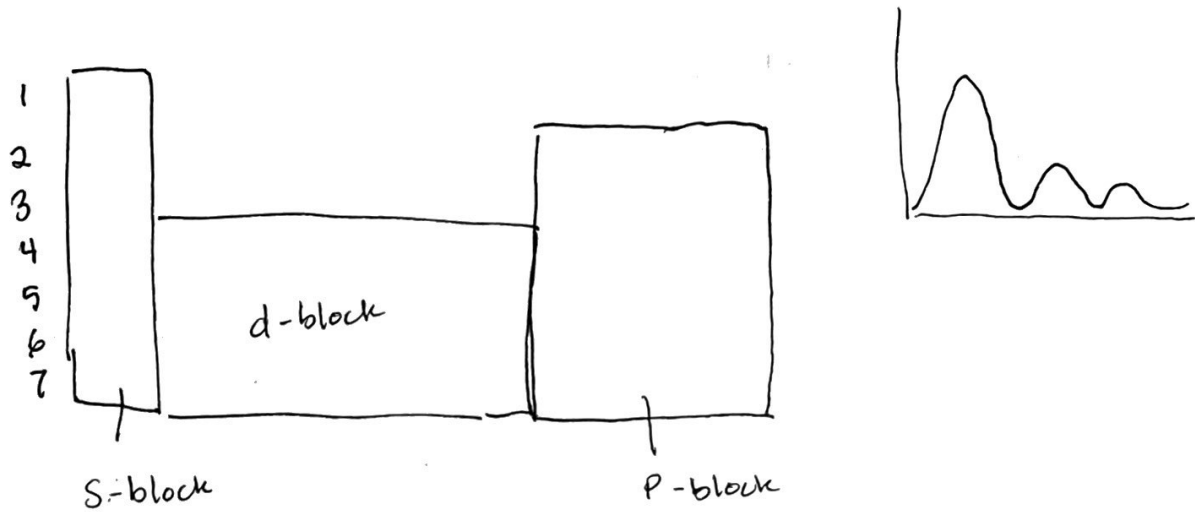
$$E = h\nu$$

$$\frac{1}{\lambda} = (1.09 \times 10^7 \frac{\text{m}}{\text{s}}) \left(\frac{1}{(2)^2} - \frac{1}{(4)^2} \right)$$

$$\frac{1}{\lambda} = 2.043 \times 10^6$$

$$[\lambda = 4.89 \times 10^{-7} \text{ m}] \Rightarrow [489 \times 10^{-9} \text{ m}]$$

$$\boxed{\lambda = 489 \text{ nm}}$$



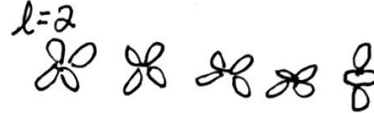
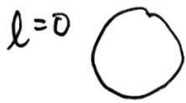
$n = \#$ row on Periodic table

$l = s = 0$

$p = 1$

$d = 2$

$f = 3$

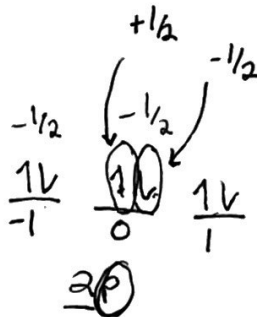


Complex!

m_l $\overline{0}$ $\overline{-1}$ $\overline{0}$ $\overline{1}$ $\overline{-2}$ $\overline{-1}$ $\overline{0}$ $\overline{1}$ $\overline{2}$

$l \pm$

m_s Spin! \uparrow $+\frac{1}{2}$, $-\frac{1}{2}$ \downarrow



\rightarrow

$n = 2$	$l = 1$	$m_l = 0$	$m_s = +\frac{1}{2}$
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$n = 2$ $l = 1$ $m_l = -1$ $-\frac{1}{2}$

$$n = 5$$

$$l = 4$$

$$m_l =$$

0 = s	1
1 = p	2
2 = d	3
3 = f	4
4 = ?	5

$\overline{-4}$ $\overline{-3}$ $\overline{-2}$ $\overline{-1}$ $\overline{0}$ $\overline{1}$ $\overline{2}$ $\overline{3}$ $\overline{4}$

9-orbitals here

$l = 4$	$l = 3$	$l = 2$	$l = 1$	$l = 0$
---------	---------	---------	---------	---------

$m_l = 4, 3, 2, 1, 0, -1, -2, -3, -4$