

CH 5 Test Review

PQN	sublevels	
1	s	s has 1 <u>sublevel</u>
2	s p	p has 3 <u>sublevels</u>
3	s p d	d has 5 <u>sublevels</u>
4	s p d f	f has 7 <u>sublevels</u>
5	s p d f	
6	s p d f	
7	s p d f	

The 6th principle energy level has 16 known orbitals.
 $s \rightarrow 1$ $p \rightarrow 3$ $d \rightarrow 5$ $f \rightarrow 7$

Max # of e^- that can fill this level is 32 e^- .

Stable elements have filled energy sublevels.

Which config is considered more stable? (B)

Which has highest energy completely filled? B.

(A) $1\uparrow 1\downarrow \quad 1\uparrow 1\downarrow \quad 1\uparrow 1\downarrow \quad 1\uparrow 1\downarrow \quad 1\uparrow 1\downarrow \quad \underline{\quad}$
 $1s \quad 2s \quad 2p \quad 2p \quad 2p \quad 3s$

or (B) $1\uparrow 1\downarrow \quad 1\uparrow 1\downarrow \quad 1\uparrow 1\downarrow \quad 1\uparrow 1\downarrow \quad 1\uparrow 1\downarrow \quad \underline{\quad}$
 $1s \quad 2s \quad 2p \quad 2p \quad 2p \quad 3s$

What are the e^- config for those above.

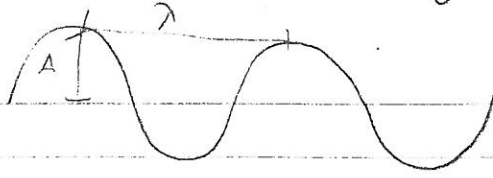
(A) $1s^2 2s^2 2p^4$ (B) $1s^2 2s^2 2p^6$

What elements are they?

(A) Nitrogen (B) Neon

Photons are released when e^- move back down to original energy level.

freq $\rightarrow s^{-1}$ or Hz
 $\lambda = \text{wavelength (m)}$



* Convert $4.25 \times 10^{-5} \text{ cm}$ to m.
 $4.25 \times 10^{-7} \text{ m}$

Energy quanta = amt of energy required to move an e^{-} from one prin energy level to another.

Quantum mechanical model - probability

Relationship between f & λ ? direct or inverse since $c = \lambda \nu$

Aufbau

Hund's

Pauli Exclusion

Ground state - lowest energy level for a given e^{-}

- de Broglie - wave-like motion
- Heisenberg uncertainty
- photoelectric - Einstein

$$E = hf$$

↑
Planck's constant $6.6262 \times 10^{-34} \text{ J s}$

$E = ?$

$$c = \lambda \nu$$

$$3.00 \times 10^8 = (380 \times 10^{-9}) \nu$$

$$\nu = 7.89 \times 10^{14} \text{ s}^{-1}$$

$$\rightarrow E = h \nu$$

$$= 6.63 \times 10^{-34} \text{ J} \cdot \text{s} (7.89 \times 10^{14} \text{ s}^{-1}) = 5.23 \times 10^{-19} \text{ J}$$