

PS6-1  
 (26) [Ar] 4s<sup>1</sup> 3d<sup>5</sup> STABILITY

STABLE → 8 valence e<sup>-</sup>  
 → Full P<sub>rincipal</sub> Energy level  
 P.E.C. 2n<sup>2</sup>

"Stable-ish" → 1/2 Filled P.E.L.

Nov 10-7:19 AM

Cr 24e<sup>-</sup>  
 [1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup> 3s<sup>2</sup> 3p<sup>6</sup>]  
 Cr ⇒ Ar 4s<sup>2</sup> 3d<sup>4</sup>

Promote

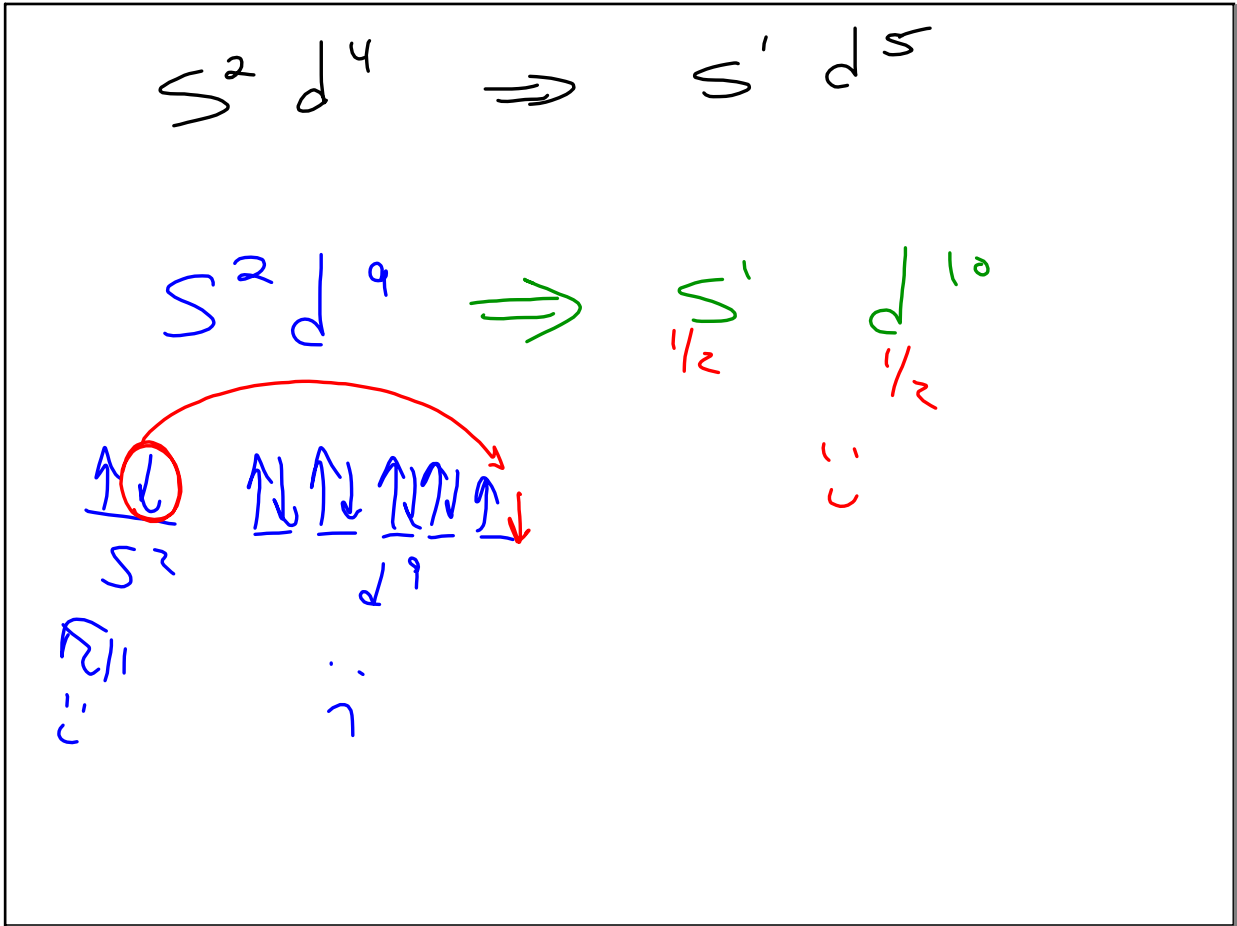
↑ ↓ (circled) → ↑ ↑ ↑ ↑  
 4s<sup>2</sup>    4s<sup>1</sup> 3d<sup>4</sup>    3d<sup>4</sup>

Full stable e<sup>-</sup>

↑ (circled)    ↑ ↑ ↑ ↑ ↑ (circled)  
 1/2 Full    3d<sup>5</sup>

4s<sup>1</sup> 3d<sup>5</sup> (circled)

Nov 10-8:15 AM



Transition elements d block filling  
 i Weird!  
Chap?

- ① Share e- between s + d to make 1/2 full sublevels to increase stability
- ② Form colorful compounds.

Nov 10-8:31 AM

EXAM 2 FALL 2020

Chap 5, 6, 7

Thermo      Atomic Theory      Periodic Table

Next week TORR

Double Periodic

Nov 10-8:36 AM

Chap?    P.T.

Periods (horizontal rows ↔)

\* Each Period STARTS a new P.E.L.

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Groups (vertical columns ↓)

Each group has similar chemical properties because... SAME # of valence e-

outermost Energy level

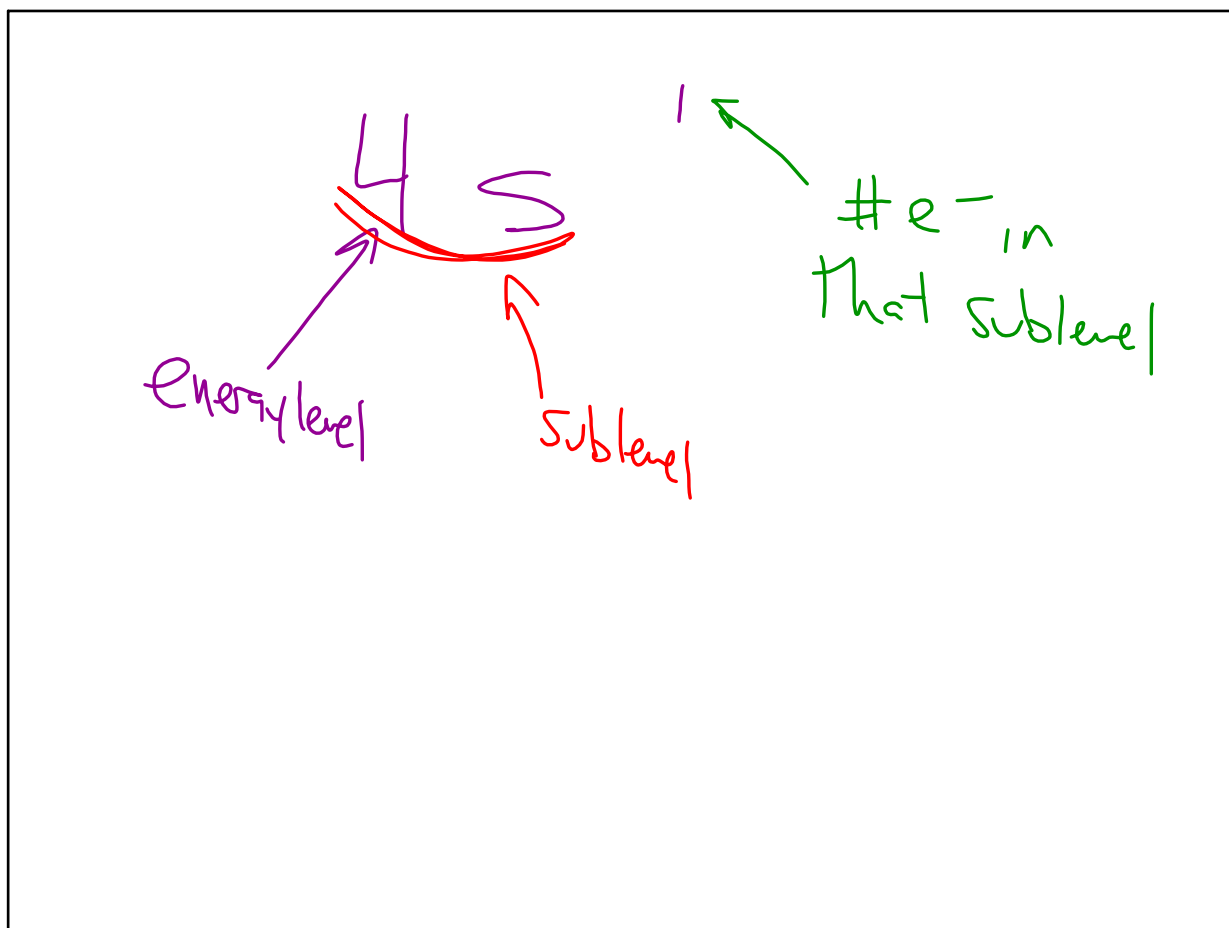
ex) Cr

[Ar] 4s<sup>1</sup> 3d<sup>5</sup>

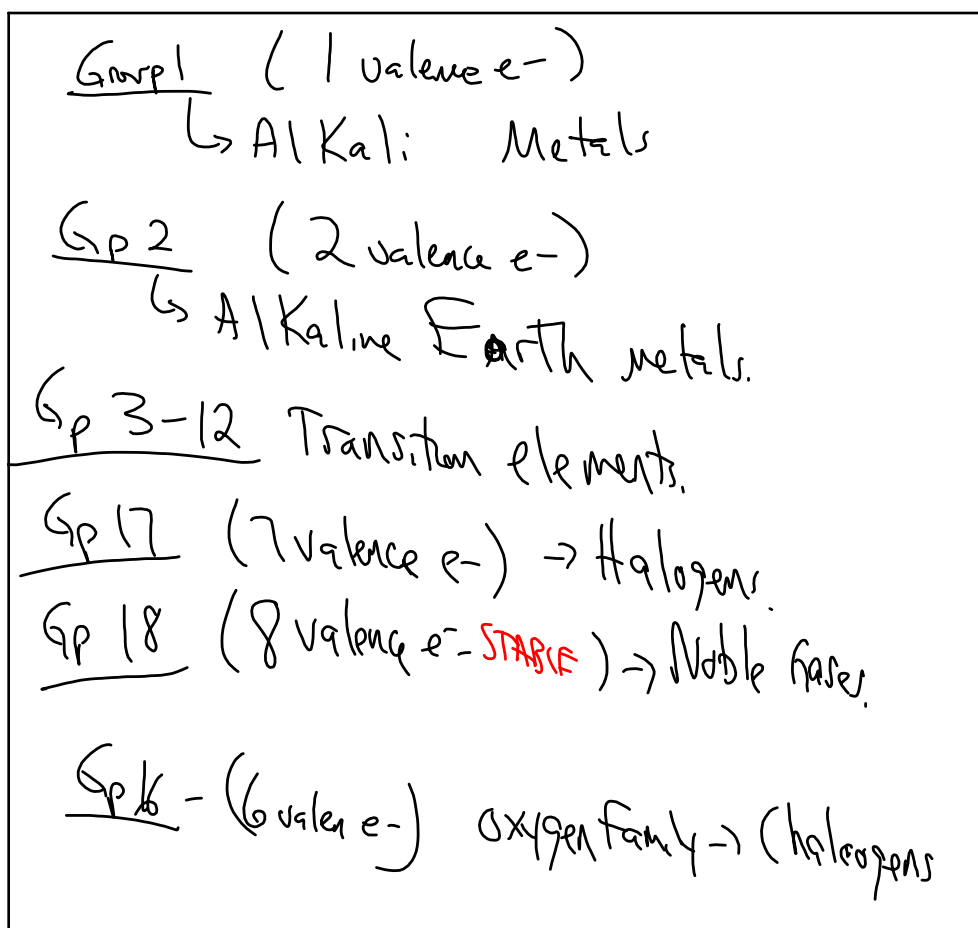
Valence ↓

Filling

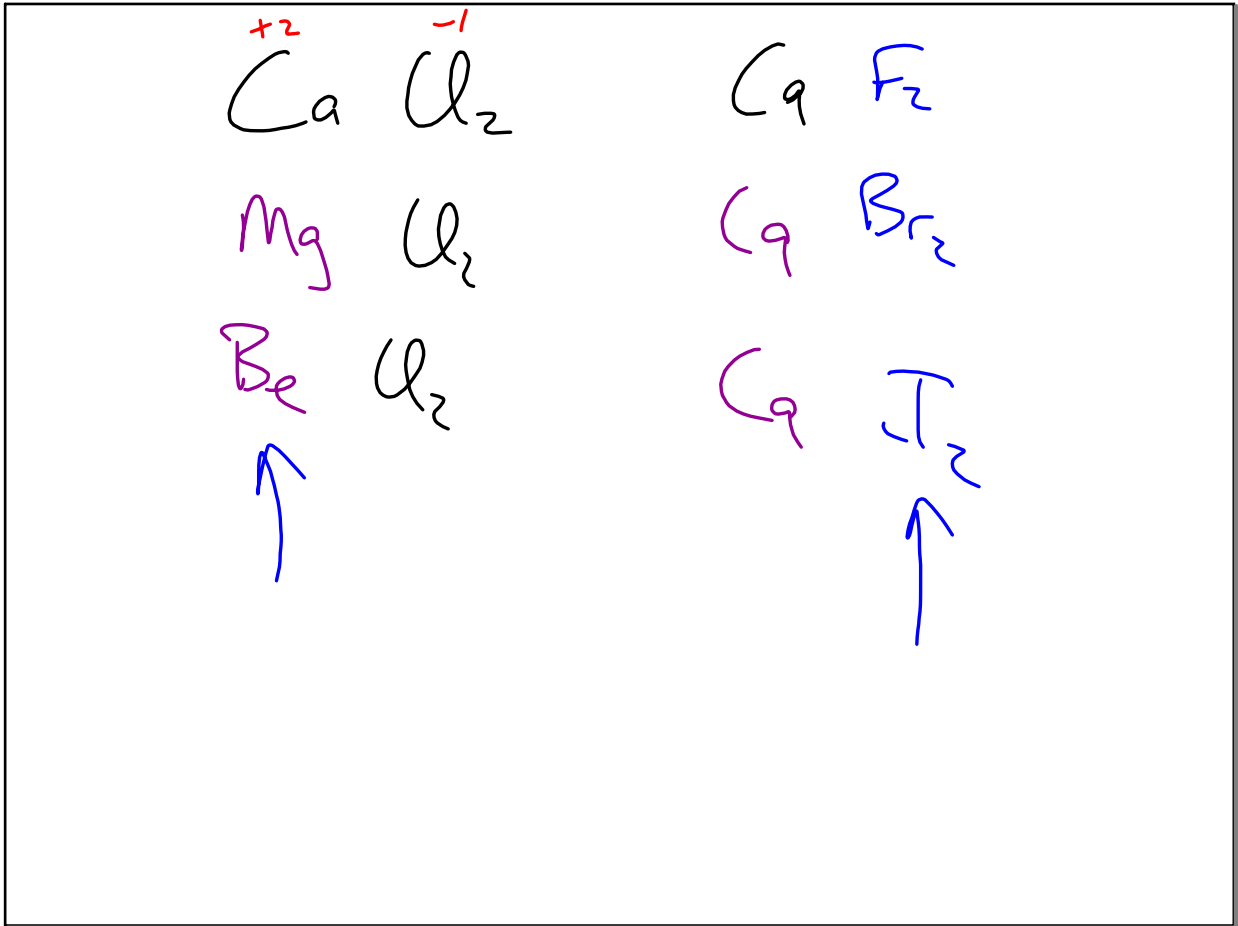
Nov 10-8:38 AM



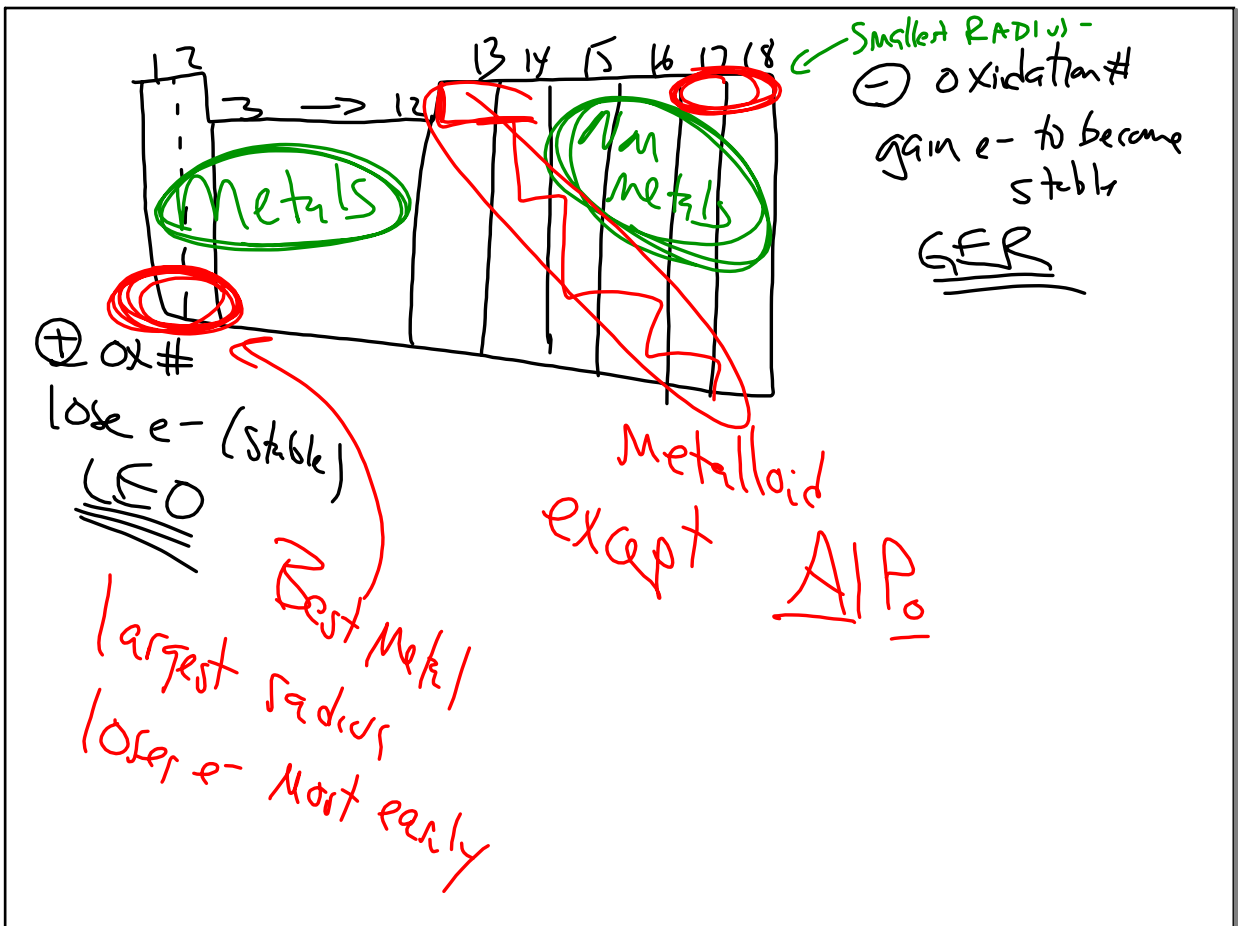
Nov 10-8:55 AM



Nov 10-8:56 AM



Nov 10-9:00 AM



Nov 10-9:01 AM

Triads  
 ↳ Octaves  
 ↳ Mendeleev (Russia) <sup>1830's</sup> \*  
 ↳ Lothar Meyer (Germany) \*

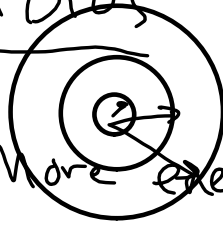
left blank spaces for yet to be discovered elements

↳ by ATOMIC MASS \* ↓ ↑

Nov 10-9:06 AM

### ATOMIC RADIUS

↓ At. radius increase ↓



More energy levels.

Atomic radius Decrease →

Same # of energy level  
 Stronger pull from nucleus

Nov 10-9:14 AM

Per 2 elements → NEUTRAL #p = #e<sup>-</sup>

|                          |                          |                         |                         |
|--------------------------|--------------------------|-------------------------|-------------------------|
| Li<br>3p 3e <sup>-</sup> | Be<br>4p 4e <sup>-</sup> | C<br>6p 6e <sup>-</sup> | O<br>8p 8e <sup>-</sup> |
|                          |                          |                         |                         |

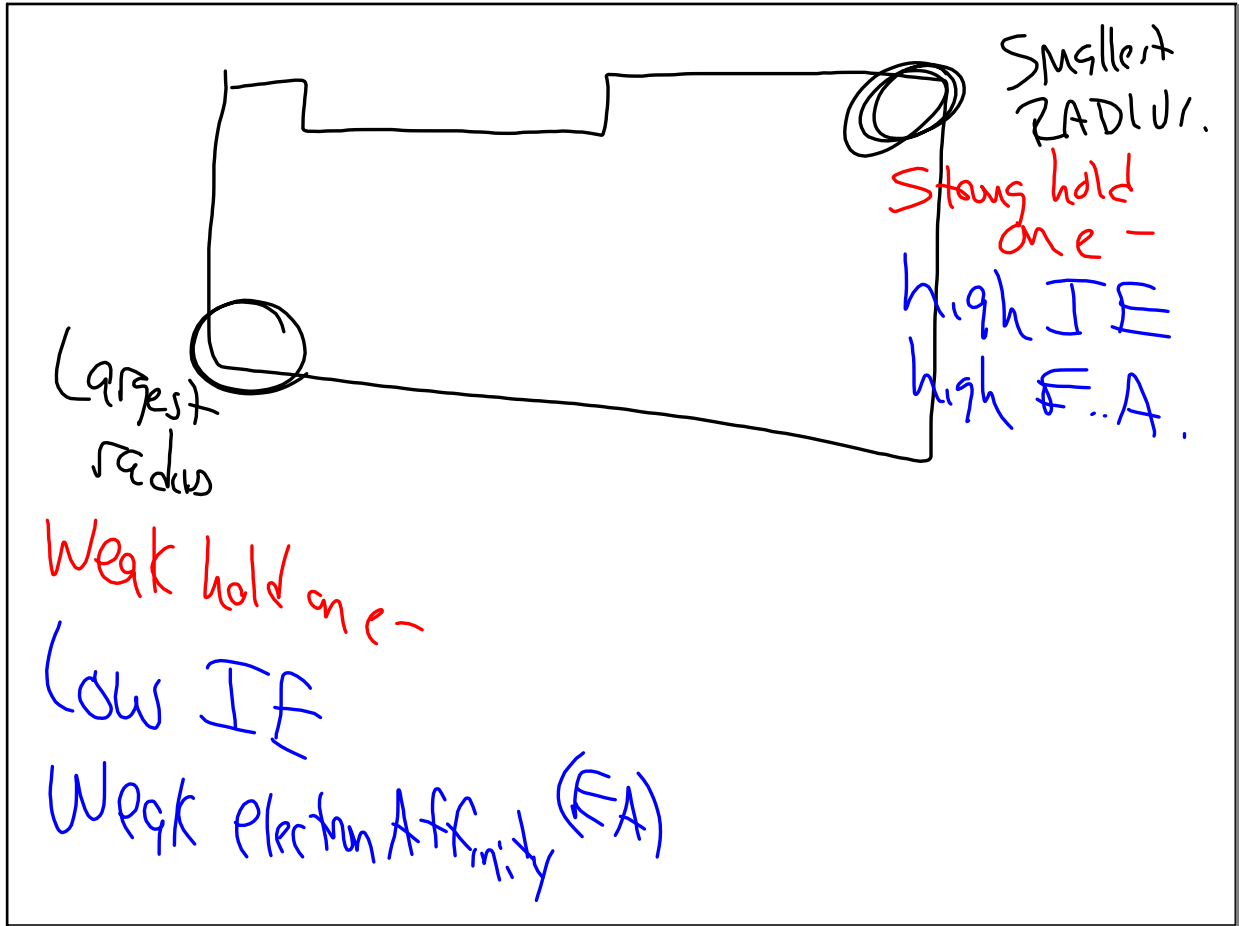
Nuclear pull gets stronger  
radius decreases L → R

Nov 10-9:16 AM

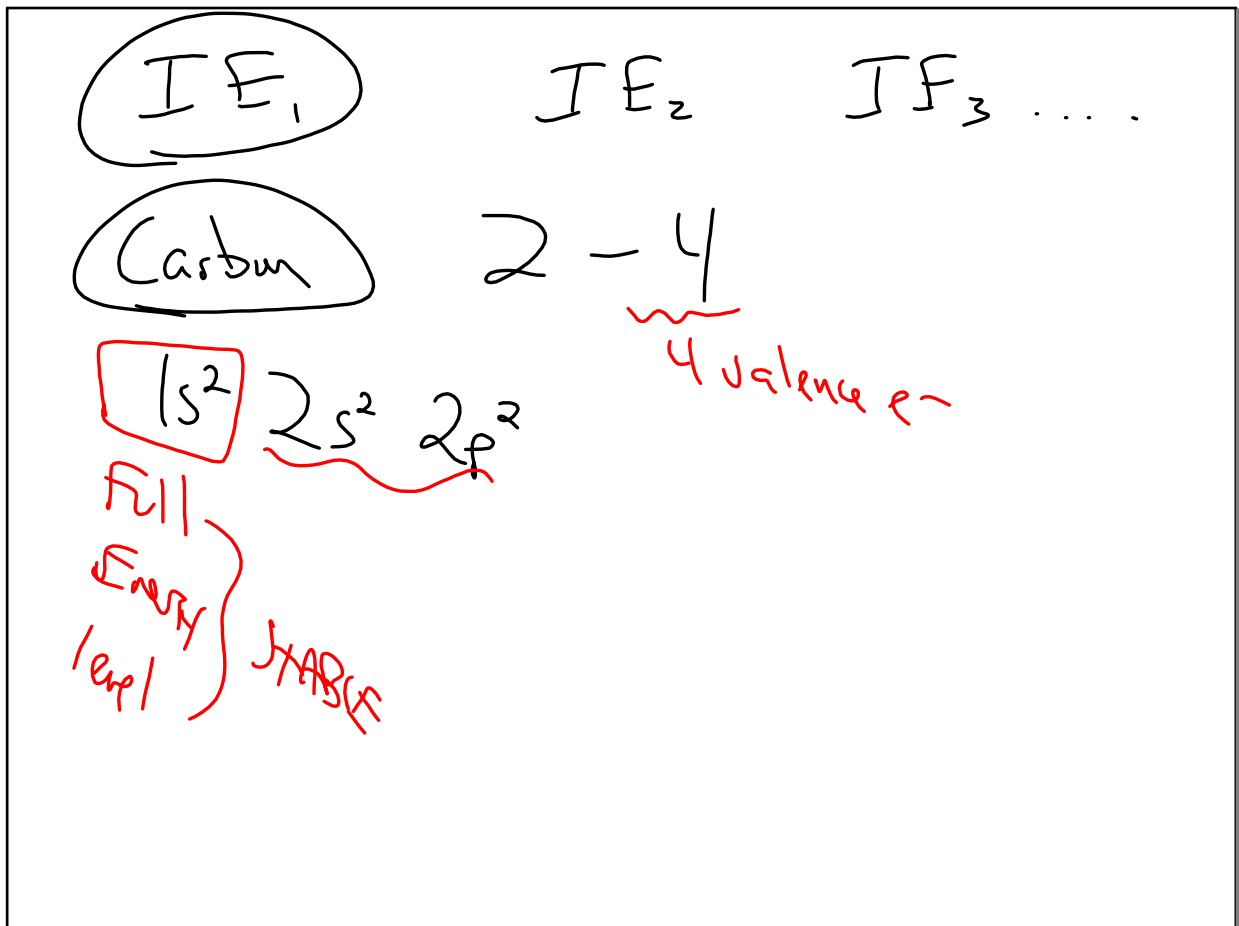
Ionization Energy (KJ) KJ/mole.

The amount of energy needed to lose the most loosely held Valence e<sup>-</sup>

Nov 10-9:20 AM



Nov 10-9:23 AM



Nov 10-9:25 AM



HW

7/ 23, 25, 28

↑  
Icons → THINK

Nov 10-9:29 AM