

last name: F17 Ex IV

****KEEP YOUR WORK AND ANSWERS COVERED.****

1. (24 pts) Indicate whether each statement is true (T) or false (F). Be certain T or F is clearly indicated.

F A 350 nm photon is in the infrared region of EM radiation.

F Following an excitation of an electron, an atom ends with less energy than before the excitation.

T In a chemiluminescent reaction, a product is made in an excited state and then relaxes, emitting a photon.

F The $n = 4$ shell has s , p , d subshells (only).

F Spin exclusion only occurs between electrons of different spins.

F A selenium atom has 18 core electrons and 6 valence electrons.

T H and He have no core electrons.

T Sc^{3+} and Cl^- are isoelectronic.

2. (4 pts) Rank MgO, KF and CaO in the order of increasing ionic bond strength.

weakest KF < CaO < MgO strongest

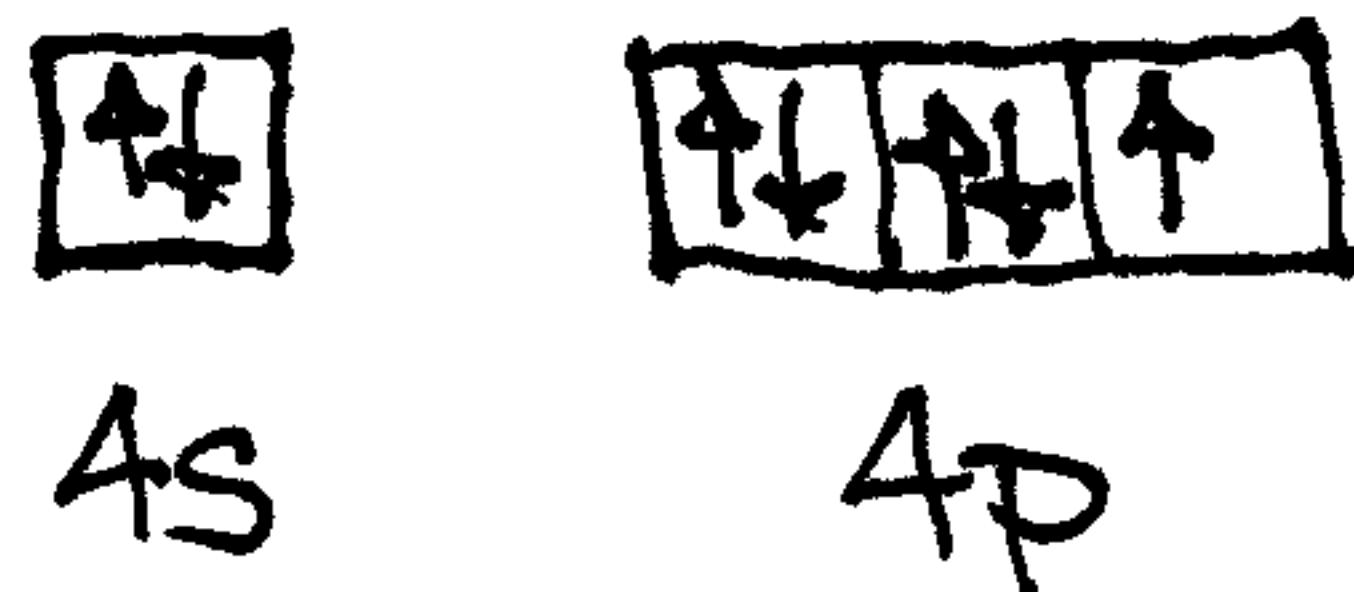
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3. (2 pts) What is the maximum number of valence electrons for any Main Group element? 8
- (2 pts) What element has the highest IE_2 in the s-block? Li
- (2 pts) What element in Period 2 has the greatest electron affinity? F
- (2 pts) What is the maximum possible number of unpaired electrons in any monatomic ion? 7

- ** 4. (10 pts)
- Which quantum number gives the shape of an orbital? l
- What element has a configuration which ends in $5p^5$? I
- What elements in Period 4 form a $3+$ cation with four unpaired electrons? Mn, Co

- ** 5. (6 pts) Using box notation, show the configuration of the valence electrons for Br.



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6. (4 pts) What elements in Period ⁴3 have three unpaired electrons in their neutral atoms? V, Co, As

- ** 7. (5 pts) Circle the wavelength (in nm) of the photon which is emitted when a hydrogen atom undergoes the relaxation $n = 6 \rightarrow n = 3$.

727	763	811	877	948	980.
1030	<u>1090</u>	1120	1150	1240	1270

8. (9 pts) Using noble gas abbreviation, give the configuration of each of the following.



- ** 9. (5 pts) Circle all of the following which are diamagnetic.

