

Periodic Properties I

1. _____ A neutral atom of a certain element has 15 electrons. Without consulting a periodic table, answer the following questions: (a) What is the electron configuration of the element? (b) How should the element be classified? (c) Are the atoms of this element diamagnetic or paramagnetic?

2. _____ Referring to a periodic table, arrange the following atoms in order of increasing radius: P, Si, N.

3. _____ Arrange the following atoms in order of decreasing radius:
C, Li, Be.

4. _____ In each of the following pairs, indicate which one of the two species is larger: (a) N^{3-} or F^- ; (b) Mg^{2+} or Ca^{2+} ; (c) Fe^{2+} or Fe^{3+} .

5. _____ Select the smaller ion in each of the following pairs:
(a) K^+ , Li^+ , (b) Au^+ , Au^{3+} , (c) P^{3-} , N^{3-} .

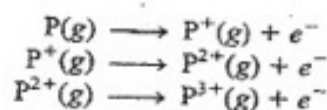
6. _____ (a) Which of the following atoms should have a larger first ionization energy: N or P? (b) Which of the following atoms should have a smaller second ionization energy: Na or Mg?

7. _____ (a) Which atom should have a smaller first ionization energy: oxygen or sulfur? (b) Which atom should have a higher second ionization energy: lithium or beryllium?

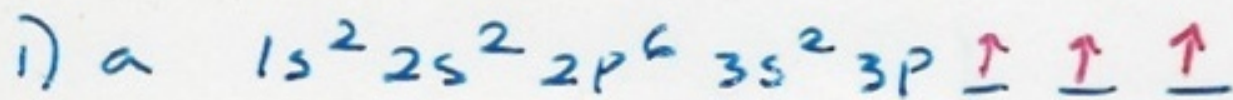
8. _____ Which is the smallest atom in Group 7A?

9. _____ Which of the following species are isoelectronic with each other? C, Cl^- , Mn^{2+} , B^- , Ar, Zn, Fe^{3+} , Ge^{2+} .

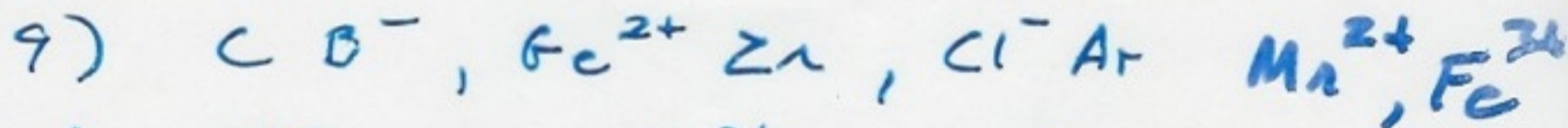
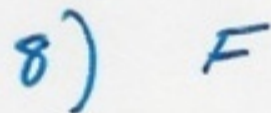
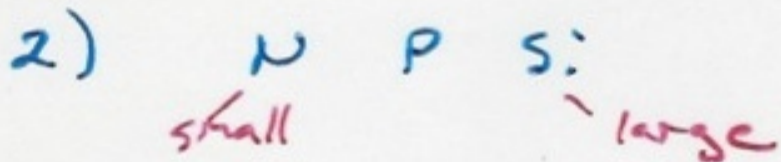
10. _____ Which one of the following processes requires the greatest input of energy? Why?



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b para



the least amount of electron repulsion

