

This is last year's first test. Note: This year the coverage has been a bit different. So some of these questions are not relevant this year.

Chem 1C Midterm Exam
Spring 2007
R. Millikan, Instructor

Name _____
PLEASE PRINT

This is a closed book test
One 3" x 5" note card allowed.
Do your work on these sheets.
Circle your final answer where appropriate.

Scoring: 1. 20/____ 4./20____
2. 20/____ 5. 20/____
3. 20/____

See attached sheet of reference data.

Total Score 100/____

20
5 ea part
1. Write the electron configuration (for example B is $[\text{He}]2s^2 2p^1$) for:

(a) The isolated Vanadium (V) atom. $[\text{Ar}] 3d^3 4s^2$ or $[\text{Ar}] 4s^2 3d^3$

(b) The isolated Sr^{2+} ion. $[\text{Kr}]$ or $[\text{Ar}] 3d^{10} 4p^6 4s^2$

(c) Consider a neutral atom with the electron configuration: $1s^2 2s^2 2p^4 3s^1$. Is this atom in an excited state or in the ground state (circle one)?

(d) Tell me what element this atom of part (c) is. F fluorine

20
2. Magnesium (Mg) has these successive ionization energies:

$I_1 = 735$, $I_2 = 1445$, $I_3 = 7730$, all in kJ/mol. Tell me:

(a) the electron configuration of Mg^+ . $[\text{Ne}] 3s^1$

(b) The electron configuration of Mg^{3+} . $[\text{He}] 2s^2 2p^5$

(c) What neutral element is isoelectronic with Mg^{3+} . F

(d) Why the big jump between I_2 and I_3 ? You are taking an e^- from the closed electron shell of $[\text{Ne}]$ which is very stable.