



Name: \_\_\_\_\_

Test 3

9. Write the formula or name of the following ionic compounds and indicate the solubility. (16 points)

$\text{Na}_2\text{SO}_3$	<u>Sodium Sulfite</u>	<u>soluble/insoluble</u>
$\text{NH}_4\text{ClO}_3$	<u>Ammonium Chlorate</u>	<u>soluble/insoluble</u>
<u><math>\text{CaCO}_3</math></u>	Calcium Carbonate	<u>soluble/insoluble</u>
<u><math>\text{Fe}(\text{NO}_3)_2</math></u>	Iron (II) Nitrate	<u>soluble/insoluble</u>

10. Draw the Lewis dot structure for NNO (use a nitrogen as the central atom). Describe the molecular and electron pair geometry as well as formal charge and oxidation state for each atom of this molecule. (15 points)



(note 2 electron pairs on terminal N and O not shown)

Terminal N atom = -1 FC, -1 OX,  $sp^2$

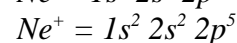
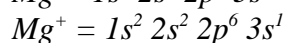
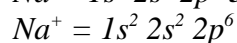
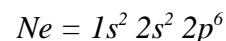
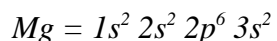
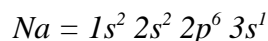
Central N atom = +1 FC, +3 OX,  $sp$

O atom = 0 FC, -2 OX,  $sp^2$

11. Arrange the following atoms in order of atomic radius from highest to lowest: Rb, K, Fe, Al, N, Ne. (12 points)

*Rb, K, Fe, Al, N, Ne (no change in order needed!)*

12. Discuss (using electron configurations and effective charge) why it is easier to remove an electron from a sodium atom than either a neon or magnesium atom. (10 points)



*The Na ionization goes from a single electron feeling a +1 effective charge to a noble gas configuration. The Mg feels a +2 effective charge (and thus is harder to remove) and goes to the Na configuration (which is not particularly stable). The Ne leaves a noble gas configuration with a +6 to +8 effective charge to a F configuration (which is extremely electronegative and unstable!)*

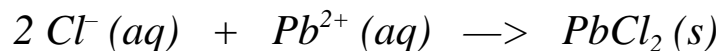
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Test 3

13. Calculate the mass percentage of Al in  $\text{Al}_2\text{O}_3$ . (10 points)

$$\frac{2 \text{ mol Al} \times (26.9815 \text{ g/mol})}{1 \text{ mol Al}_2\text{O}_3 \times (101.9612 \text{ g/mol})} \times 100\% = 52.93\% \text{ Al by mass}$$

14. What is the net ionic equation for each of the following reaction mixtures (write NONE if there is no net reaction) (12 points)



*None*

