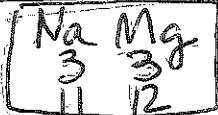


Topic Reminder Q4

Periodic Trends

	1 st ionization kJ/mol	2 nd ionization kJ/mol	3 rd ionization kJ/mol
Sodium	550	1400	1700
Magnesium	700	1100	

Ionization energy



1. Why is the 1st ionization of magnesium larger than the 1st ionization of sodium.

Both Na and Mg have the same number of energy levels. Mg has more proton/nuclear charge, giving a greater coulombic attraction and higher 1st ionization energy.

2. Why is the 2nd ionization energy of sodium higher than the 2nd ionization of magnesium.

Na: Mg^{+1} When removing the second electron from Na, the e⁻ is being removed from the 2nd energy level, which is less of a distance (more coulombic attraction) than the 3rd energy level.

3. Would you predict the 3rd ionization energy of magnesium to be (higher/lower) than the 3rd ionization of sodium? Explain.

$Na^{+2} Mg^{+2}$ The 3rd ionization energy would be greater for Mg due to its greater nuclear charge, giving a higher coulombic attraction.

- Radius: 4. $O^{+2} > F^{-1}$ explain Both O and F have the same number of energy levels, F has more nuclear charge (9p⁺) and more coulombic attraction, making F smaller.

5. $O^{+2} > Ne^{-1}$ explain Both O⁻² and Ne have 2 energy levels. Ne has greater nuclear charge (10p⁺) and more coulombic attraction, making Ne smaller.

6. $Na^{+1} > Ne^{-1}$ explain Na has more energy levels, so Na is larger

7. Na^{+1} exists in nature but Na^{2+} does not. Hypothesis?
 Na^{+1} has many protons (11p⁺) and Z energy levels. Due to its high charge and close distance (Coulomb's Law), it would take a lot of energy to pull the 2nd electron off.