Year 13 Science: Electron configuration and periodic trends

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. Write the electron configuration of titanium (Z = 22).

2. Write the electron configuration of Fe^{2+} (Z = 26).

3. Which is larger, a magnesium atom or a Mg^{2+} ion?

4. Which has the higher first ionisation energy, phosphorus or sulfur?

5. Put nitrogen, oxygen and fluorine in order of increasing electronegativity.

6. Write the electron configurations of vanadium, V (Z = 23), and Ni^{2+} (Z = 28), using s, p, d notation.

7. Explain why the first ionisation energy of aluminium (578 kJ mol^{-1}) is lower than that of magnesium (738 kJ mol^{-1}).

8. The K^+ ion has a radius of 138 pm and the Cl^- ion 181 pm. Explain why K^+ is smaller, even though both ions have the same number of electrons.

9. Justify the trend in electronegativity from chlorine (3.16) to bromine (2.96) to iodine (2.66).

Fix the mistake

10. Correct this statement: "Fe^{2+} is [Ar] $3d^4\ 4s^2$, because the last electrons in are the first out."

11. Correct this statement: "Atomic radius gets bigger across a period because there are more electrons."

12. Correct this statement: "Chromium is [Ar] $3d^4\ 4s^2$, following the filling order."

13. Correct this statement: "Ionisation energy decreases down a group because there are more protons."