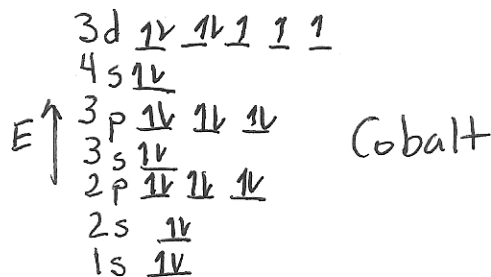


For questions 1, 2 and 3 please do the following:

- Draw an energy diagram
- Write the electronic configuration
- Answer the questions given.



1. Cobalt  $[Ar]4s^23d^7$
- How many electrons are in the fourth shell?

2

- Cobalt (II) Oxide has been used for centuries as a coloring agent because it provides a deep shade of blue to fired pottery - where we get the color name: cobalt blue. What is the electronic configuration for this ion?

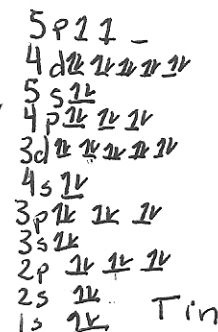


2. Tin
- The common oxidation states of tin are +2 and +4. Explain this fact in terms of likely electronic configurations.

There are four electrons in the 5th shell. For the 2+ ion the 5p electrons are removed. For the 4+ ion all four n=5 electron

- How many electrons are unpaired in the tin atom? are removed.

2



3. Molybdenum (not generally covered in 201 but since this is a practice quiz I'll use this example)

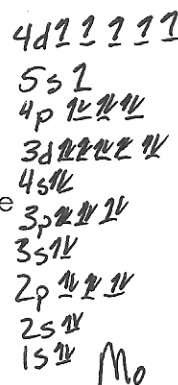
- How many electrons have  $l = 2$ ? d-orbital electrons

15

- Molybdenum(VI) chloride,  $MoCl_6$ , is a brown solid. What is its electronic configuration of the molybdenum ion?



It is isoelectronic with Krypton.



4. Place the following sets of atoms in order by size - smallest to largest

- P, Ag, Fr

- Na, Al, Cl

5. Explain why Caesium is much more reactive than sodium by <sup>of</sup> discussing the ionization energy of these atoms.

Caesium has a lower ionization energy than sodium because it is a larger atom and the valence electrons are farther from the nucleus. Since the electron takes less energy to remove Cs is more reactive.