Week 4 question: (NZIC 2013)

The letters **V**, **W**, **X**, **Y** and **Z** represent five elements. These letters bear no relationship to the symbols of the elements.

**V** has the lowest atomic number of the set.

The atomic number of **Z** is twice that of **V**.

**Z** and **Y** are not in the same period.

**V**, **W** and **X** are all in the same period

**X** and **Y** are in the same group of the Periodic Table.

The elements form compounds with the formula **AX3** where **A** can be **V**, **W**, **Y** or **Z**

Identify the elements and the compounds represented by the four formulae, **AX3** and explain your decisions.

Week 4 answer: (NZIC 2013)

To forman AX3 compound with different elements X would form only one bond so likely a halogen which makes Y a halogen as well. If **V** is **aluminium** with atomic number 13 atomic number of **Z** would 26 which is **iron**. W and X are the same period as V but with higher atomic numbers. **W** would be **phosphorus** and **X** is **chlorine**. **Y** is a halogen but not in the same period as Z (so not Br) and not a lower atomic numbers than V so must **iodine**. The **AX3** compounds are AlCl3, PCl3, FeCl3 and ICl3.

Week 5 question: (NZIC 2009)

Consider compounds **A**, **B** and **C** with the molecular formula C5H12O.

* + Compound **A** reacts to K2Cr2O7/H+(*aq*) to give **D** (C5H10O). Neither **A** or **D** exist as enantiomers.
  + Compound **B** also reacts with K2Cr2O7/H+(*aq*) to give **E** (C5H10O2). Both **B** and **E** exist as enantiomers.
  + Compound **C** reacts with K2Cr2O7/H+(*aq*) to give **F** an isomer of **D**. Compound **C** exists as enantiomers but compound **F** does not. Compound **C** reacts with concentrated H2SO4 to give two different alkenes (**G** and **H**), neither of which exists as *cis-trans* isomers.

Draw the structures and name each of the compounds **A** to **H.**