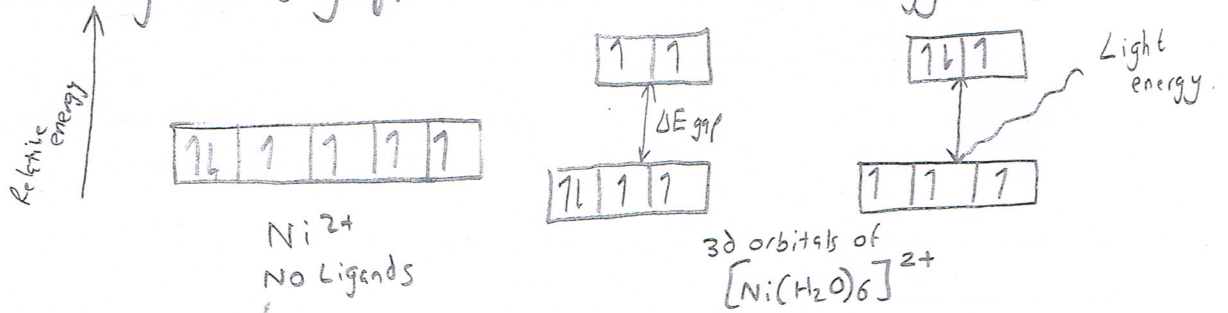


## Formation of Coloured Ions

The addition of Ligands causes colour changes.

When they bond they split the 3d subshell into two energy levels.



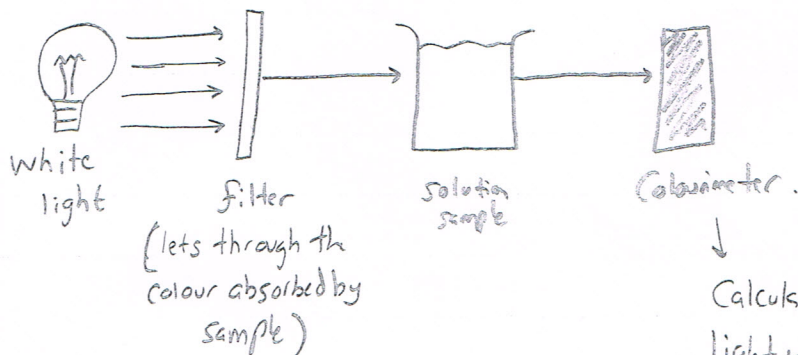
Light causes electrons to jump to higher orbitals. The amount of energy needed to make the electrons jump depends on the size of the  $\Delta E$  (energy gap), the central metal ion and its oxidation state as well as the coordination number.

The colours are complementary to the frequency of Light absorbed.

Example:  $[Cu(H_2O)_6]^{2+}$  is blue because it absorbs yellow light and therefore the rest appears blue.

No 3d electrons or full shell means white or colourless solutions.

Spectrometry can be used to find concentrations of transition metal ions.



these are measured against known values! ← [the more concentrated the more absorbed]