COMPLEX IONS - NAMES

1. An anionic complex carries a negative charge, whereas a cationic complex carries a positive one.

2. a) hexaaquacobalt(II) ion

   b) tetraamminediaquacopper(II) ion

   c) tetrahydroxoaluminate(III) ion (The (III) is often omitted in ions where the metal usually has the same oxidation state in all its compounds. The "ate" ending shows the negative ion.)

   d) hexacyanoferrate(II) ion (Each cyanide ion carries a charge of -1, and there are six of them. To give an overall charge of 4-, the iron ion must have a charge of +2, and so an oxidation state of +2 as well.)

   e) hexacyanoferrate(III) ion by the same logic as above.

3. a) $[CuCl_4]^{2-}$ (This was originally made from four chloride ions each with a single negative charge and a copper(II) ion with a 2+ charge. Therefore the overall charge is 2-.)

   b) $[AlF_6]^{3-}$ (Use a logic similar to the one in the last question.)

   c) $[Cr(H_2O)_5(OH)]^{2+}$ (The water molecules are electrically neutral, and the hydroxide ion originally had a single negative charge. The name tells you that the chromium is in the +3 oxidation state and started as a Cr^{3+} ion. The net charge is therefore 2+.)

   d) $[Ag(NH_3)_2]^{+}$ (The ammonia molecules are neutral and so add no charge to the original 1+ silver ion.)

   e) $[V(H_2O)_6]^{3+}$ (Use the same logic as in the last question. The name tells you that the vanadium is in the +3 oxidation state, and so the original uncomplexed ion was V^{3+}. The water makes no difference to the overall charge.)