

- Can methane act as a ligand? Explain your answer.

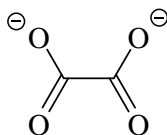
Marks

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No. Ligands are, by definition, electron pair donors and so require at least one lone pair of electrons that can be donated to a metal ion to form a covalent bond. Methane, CH₄, has no lone pairs.

- Fe(II) generally forms octahedral complexes. How many different complex ions can be formed when Fe(NO₃)₂ is dissolved in an aqueous solution of sodium oxalate? The structure of the oxalate ligand is shown below.

4



7 complex ions are possible – see below.

Answer: 7

Draw diagrams of any 3 of these complexes, including at least one that is chiral.

