of monomeric units arranged in layers, as previously proposed (Martell & Calvin, 1959). Dimerization is achieved by the sharing of one oxygen atom from each 'salen' ligand by two cobalt atoms. Thus the cobalt atom is five coordinated in a distorted rectangular based pyramid with an axial bond Co–O of 2·25 Å. The close approach of the two halves of the dimer requires the two planes of the 'salen' ligand to bend away from each other. The Co–N (mean value 1·88 Å) and Co–O (1·88 Å) bond lengths agree with the mean values of 1·88 and 1·86 Å respectively, found in some organo-cobalt derivatives of bis(acetylacetone)-ethylendiimine ($BAEH_2$), (Brückner, Calligaris, Nardin & Randaccio, 1968*a*). On the other hand, the Co–O value of 1·95 Å agrees with the mean value of 1·92 Å found in vinyl-aquo(BAE)Co (Brückner, Calligaris, Nardin & Randaccio, 1968*b*). In the last compound the lengthening of Co–O bonds has been ascribed to the intermolecular hydrogen bonds in which these oxygen atoms are involved. Analogously the lengthening found here can be ascribed to the additional coordination bond of 2·25 Å in which the oxygen atom is involved.

The torsional angle around the CH_2–CH_2 bond is 42·0° and the angle between the planes passing through the two halves of the 'salen' ligand is 22·2°. The close stacking of the dimeric units does not introduce voids in the structure. Thus the crystal packing of the inactive form is such that it may be regarded as 'self-protecting' towards oxygen absorption.

The dimeric nature of this compound suggests a possible explanation of the two-to-one stoichiometry of the oxygenated adduct. If one assumes that the crystals of the active form consist of dimers packed in an open way, the formation of an adduct $[(cosalen)_2O_2]_n$ seems likely when the oxygen molecules penetrate into the voids of the structure. On the contrary, in the model of equally displaced monomeric units, proposed by Calvin, the 2:1 and 1:1 ratios would both be possible.

However this conjecture requires further experimental information to support it.

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