It is preferable to evaporate the solvent with warm air before spraying with the reagent.

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[1] Lederer, M., and Lederer, E., "Chromatography", 158 (Elsevier Pub. Co., 1953).
[2] Giovannozzi-Sermanni, G., I° Congrès International Scientifique du Tabac., Paris, 7–14 Septembre, 1955.

## Ultra-Violet Absorption of Oxygen in Organic Solvents

It has been found that, in a number of organic solvents, dissolved oxygen gives rise to absorption in the far ultra-violet. This absorption is completely eliminated when oxygen is removed by boiling, or by bubbling nitrogen or other gases through the solvent.

In Fig. 1 are shown spectra of cyclohexane at 30° C. in equilibrium with oxygen at several partial pressures. In the wave-length range studied, the absorbance due to oxygen is found to be directly proportional to the partial pressure of oxygen above the solution. Similar spectra have been obtained with *n*-hexane, *n*-heptane, methanol, ethanol and diethyl ether.

To determine whether the absorption might be due to free oxygen, the solubility of oxygen in cyclohexane was measured. At a partial pressure of one atmosphere, approximately 0·27 vol. of oxygen (reduced to standard temperature and pressure) dissolves in one volume of cyclohexane. The absorbance of an equivalent concentration of gaseous oxygen is negligible in the spectral range considered, so the absorption of the solution must be due to interaction between oxygen and the solvent.

Assuming that this interaction results in the formation of a molecular complex which is in turn responsible for the absorption, a reaction of the form $mO_2 + nS \rightleftharpoons (O_2)_m{\cdot}S_n$ with equilibrium constant $k = a_c/a_0{}^m a_s{}^n$ may be supposed to apply, where $O_2$ is oxygen, $S$ is solvent, $m$ and $n$ integers, and $a_c$, $a_0$ and $a_s$ are the activities of the complex, oxygen and solvent respectively. For the activity of oxygen the partial pressure $p$ may be substituted. Assuming, furthermore, that the solution is ideal and that Beer's law holds for the complex, a new equilibrium constant is found: $k' = D/p^m x^n$ ($D$ is the absorbance at a given wave-length due to the complex, and $x$ is the mole fraction of solvent).

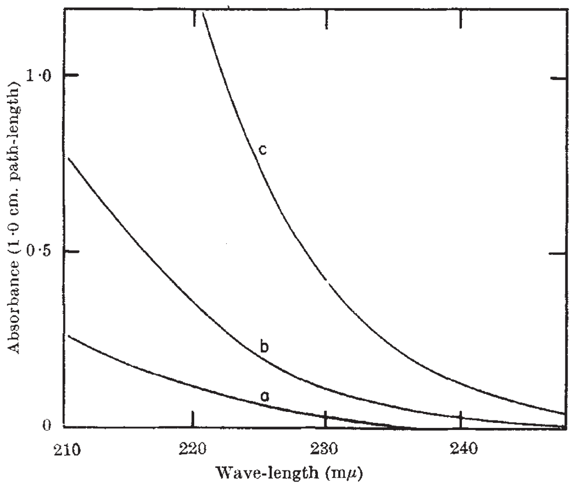


Fig. 1. Spectra of cyclohexane in equilibrium with partial pressure, $p$, of oxygen: $a$, $p = 0$; $b$, $p = 0{\cdot}18$ atm.; $c$, $p = 0{\cdot}84$ atm.

As the solvent is present in large excess, $x$ is essentially independent of $p$. Consequently, from the proportionality of $D$ to $p$, one must conclude that $m = 1$.

The value of $n$ was found by determining the dependence of absorbance on solvent composition, for a series of mixtures of cyclohexane and *n*-heptane at a given partial pressure of oxygen. The absorbance was considered to be the sum of the absorbances of the cyclohexane and of the *n*-heptane complexes, the contributions of each being governed by the separate equilibrium constants, $k'$.

As oxygen absorbs considerably less in *n*-heptane than in cyclohexane, although equally soluble in the two solvents, definite conclusions could be drawn only with regard to the latter. The results indicate that, for cyclohexane, $n = 1$; or, in other words, cyclohexane and oxygen form a 1 : 1 molecular complex.

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## Ectotrophic Mycorrhiza in Renantherous Species of *Eucalyptus*

There appear to be in the literature no detailed studies of mycorrhiza in *Eucalyptus*. Brief references are made by Samuel[1], in South Australia, and Smith and Pope[2], in South Africa.

It might be thought mycorrhiza plays no significant part in success or failure of *Eucalyptus* introductions since so many species have been successfully cultivated as exotics in numerous countries. While this is true of *Eucalyptus* as a whole, introduction records show that species of the group *Renantherae* are largely exceptional to this.

The failure of the *Renantherae* is striking when it is realized that they have been introduced on many occasions because they contain a larger percentage of good timber species than any other group of the genus. The situation is well illustrated by records from Cyprus. Chapman[3] lists twenty-one renantherous species in a total of about seventy introductions since 1878; but not one of them could be found growing on the island in 1953, although representatives from all other groups were found.