Comments on the Use of the Lovibond System

Dear Sir: May I be allowed to comment on the article by D. R. Erikson entitled "Finished Product Testing" in the November 1967 issue of the Journal? This contains the remark "The use of Lovibond glasses is limited in that brown or green pigments will interfere with the yellow or the red comparison."

This is quite true when describing the manner in which Lovibond glasses are used in the official Methods of the Society, but is wholly untrue of the Lovibond system as it is intended to be used.

The reason that the AOCS decided—very many years ago—to use the Lovibond scale in a way peculiar to themselves was perfectly valid, and the method as adopted is wholly practical.

Color is three-dimensional, and can only be described or specified in terms of three figures. The Lovibond system is based on three subtractive primaries, (red, yellow and blue as popularly described) and when thus used can accurately measure and define any color.

The scale was designed so that equal values of all three together produced a neutral tint. Hence, if unequal values of all three are used together, the amount of the lowest value represents neutral (dullness) and the balance is the visual color of the sample.

For reasons of ease in handling, the AOCS decided to ignore the brightness factor in this test, and judge only the hue and saturation (chroma). The eye and brain together can do this, whereas it is much more difficult instrumentally. To help in this assessment, separated fields of view were introduced, so as to reduce brightness discrimination.

A further simplification was also introduced. Whereas to match a color *exactly* all the parameters should be variable, it was decided that it was only the redness which was of interest in the special circumstances of the AOCS requirements. Yellow was necessary to make the colors look similar, and thus allow of the redness assessment, but the amount of yellow was unimportant. Therefore the use of a fixed yellow value was adopted, only the red being viewed critically.

For the special requirements of the AOCS test, all this is perfectly valid and works well as a simplified evaluation test.

Unfortunately, many people are prone to make statements, such as was made in Erikson's paper, which emphasize the inadequacies of the AOCS system, and at the same time fail to explain that the inadequacies are not due to the system as originally established by the Tintometer Limited, who have conscientiously pointed out this situation to the Oil Chemists' Society and to the users of this equipment.

My anxiety is that the statement as published gives the impression that the Lovibond system is incapable of measuring any "off hues" of oils, and in fact in the next sentence the author suggests that because of this defect the Lovibond system should be replaced. It is the special method of using Lovibond glasses (perfectly valid in itself) which gives rise to this defect.

A correctly used Lovibond system can give a complete definition of color and can be converted to C.I.E. coordinates, as can a spectrophotometric result. If you take one of the wheels off a tricycle, it is not then reasonable to complain that you cannot ride it.

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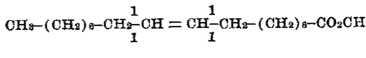
Thermal Decomposition of Methyl Oleate

Sir: On heating methyl oleate at 280C in an inert atmosphere we could isolate the following compounds as principal decomposition products: methyl decanoate, 9-octadecene, dimethyl 9-octadecene-1,18-dioate, 9,17-hexacosadiene, methyl 9,17-hexacosadienoate and dimethyl 9,17-hexacosadiene-1,26-dioate (Sen Gupta, Fette, Seifen, Anstrichmittel *68*, 475, 1966). A part of the methyl oleate dimerized. The structure of the dimers was dealt with in a later publication (Sen Gupta, Fette, Seifen, Anstrichmittel *69*, 907, 1967). Basing on the structure of the above mentioned main decomposition products and also on some additional experimental evidence we suggested a mechanism of the thermal decomposition of methyl oleate (Sen Gupta, Fette, Seifen, Anstrichmittel *68*, 475, 1966), according to which the C-C bonds alpha to the double bond are homolytically cleaved with production of 4 free radicals [I–IV]. Various reactions of these radicals lead to the compounds isolated.



$$CH_3{-}(CH_2)_6{-}CH_2\overset{1}{\underset{1}{-}}CH = CH\overset{1}{\underset{1}{-}}CH_2{-}(CH_2)_6{-}CO_2CH_3$$

$CH_3{-}(CH_2)_6{-}CH_2\cdot$ [I] $\cdot CH_2{-}(CH_2)_6{-}CO_2CH_3$ [III]

$\cdot CH = CH{-}(CH_2)_7{-}CO_2CH_3$ [II] $CH_3{-}(CH_2)_7{-}CH = CH\cdot$ [IV]

In a recent publication Nawar and Dubravcic (Nawar and Dubravcic, JAOCS *45*, 100, 1968) suggest—without presentation of new data—an alternative mechanism for the formation of the compounds we isolated from heated methyl oleate. This is based on a splitting of the C-C bonds beta to the double bond. Under these circumstances we feel obliged to communicate that we did consider the suggested alternative mechanism before our paper (Sen Gupta, Fette, Seifen, Anstrichmittel *68*, 475, 1966) was pub-