the suggestion that this society investigate through one of its committees, the possibilities of using Isopropyl Alcohol as a solvent in free fatty acid determinations in crude cotton oil and in the oil from cottonseed meats either as a substitute for Specially Denatured Alcohol or as an alternative solvent. It is also suggested that the committee be requested to study further the possibility of recovering the Isopropyl Alcohol for re-use.

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THE EFFECT OF VOLTAGE AND TYPE OF EYEPIECE ON LOVIBOND COLOR READINGS

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Abstract

Small changes in line voltage have very little effect on Lovibond color readings. However, readings made at 120 volts are slightly higher than those made at 100 or 110 volts.

Color readings with the prismatic eyepiece are slightly lower than those obtained with the pinhole type. The large split field obtained with the prismatic eyepiece makes colors easier to match than the two small separate fields obtained with the pinhole type.

DURING the past few years our Chattanooga laboratory has made a number of tests to determine the effect of voltage, type of eyepiece, and other variable conditions on Lovibond color readings.

Voltage

The Methods of the American Oil Chemists' Society require the use of a 100 watt blue frosted Mazda bulb in reading colors. However, recommendations are not made as to exact line voltage or voltage rating of the bulb. Since relatively small changes in line voltage produce small differences in quality and greater differences in the intensity of light, it was thought this might be responsible for occasional discrepancies in color readings.

Using the prismatic type eyepiece, and a new 115 volt 100 watt blue frosted bulb, two series of tests were made with the line voltage at 100, 110, 115 and 120. In the first series a color tube filled with white paraffin oil to a depth of 5¼ inches, was used with the color glasses. In the second series an empty color tube was used. Readings were made by several observers, none of whom knew the voltage at which they were reading the colors. There was so little difference in the results of the individual observers that only the averages are reported (Table I).

The results indicate that small changes in voltage have very little effect on Lovibond color readings. However, readings made at 120 volts were slightly higher than those made at 100 and 110 volts.

TABLE 1. EFFECT OF VOLTAGE ON LOVIBOND COLOR READINGS

Sample	No. of Observers	100 volts Color R.	110 volts Color R.	115 volts Color R.	120 volts Color R.
A. 5¼" column of white paraffin oil used in color tube on side of tintometer with color glasses.					
1	3	2.57	2.60	2.67	2.63
2	3	4.63	4.67	4.70	4.77
3	3	9.93	10.00	10.00	10.17
Average		5.71	5.76	5.79	5.86
B. Empty color tube used with color glasses.					
4	4	2.45	2.48	2.45	2.53
5	4	5.50	5.53	5.60	5.68
6	4	7.98	8.00	8.10	8.08
Average		5.31	5.34	5.38	5.43

Type of Eyepiece

Our rules permit the use of either the pinhole or prismastic type eyepiece for reading colors. The prismatic eyepiece used in our laboratory has the same outside dimensions as the pinhole type.

Both types have been mentioned in the literature, but apparently a comparison of the two on identical samples has not been published.

In these tests four samples of approximately the same color were read with the pinhole type eyepiece. The order of the samples was changed, and readings made with the prismatic type. An empty color tube was used with the color glasses, and all samples read by four observers (Table II).

TABLE II. COMPARISON OF RESULTS OBTAINED WITH PRISMATIC AND PINHOLE EYEPIECES

Sample No.	Average Color-R. Prismatic	Average Color-R. Pinhole	Mean deviation from Average Color-R. Prismatic	Mean deviation from Average Color-R. Pinhole
7	2.30	2.53	0.00	0.03
8	2.33	2.47	0.03	0.03
9	2.57	2.70	0.03	0.07
10	2.50	2.73	0.00	0.09
Average	2.43	2.61	0.02	0.06
11	5.65	5.73	0.10	0.14
12	5.53	5.60	0.08	0.10
13	5.38	5.45	0.08	0.10
14	5.45	5.53	0.08	0.09
Average	5.50	5.58	0.09	0.11
15	7.53	7.70	0.08	0.10
16	7.28	7.45	0.09	0.15
17	7.23	7.45	0.11	0.10
18	7.63	7.90	0.04	0.10
Average	7.42	7.63	0.08	0.11
19	9.20	9.25	0.15	0.16
20	8.00	8.18	0.05	0.09
21	8.25	8.38	0.10	0.09
22	8.20	8.30	0.05	0.10
Average	8.41	8.53	0.09	0.11
Average all Samples.	5.94	6.08	0.07	0.10

On each of the sixteen samples it will be noted that the prismatic reading is slightly lower than the one obtained with the pinhole eyepiece. The mean deviation from the average for all samples is 0.07 red for the prismatic and 0.10 red for the pinhole type. While this difference is small it is in favor of the prismatic type in each series of four samples. The four observers agreed that the large split field obtained with the prismatic eyepiece made the colors easier to match than the two small separate fields obtained with the pinhole type.

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