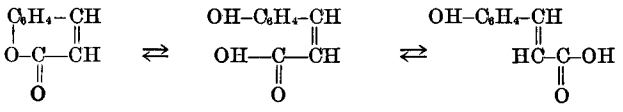

Coumarin | Coumarinic acid (cis-form, unstable) | Coumaric acid (trans-form, stable)

For the purpose of our investigation it is interesting that coumaric acid shows fluorescence under a quartz-lamp. On the other hand it has been mentioned that maleic acid, incidentally a cis-compound, has the properties of an inhibitor in autoxidation. At the present stage, the explanation seems to be that coumarin is converted, in the presence of an alkali, into the salt of the coumaric acid, which is in turn converted into the stable coumaric form, and it is one of the two salts which acts as an inhibitor.

Heliotropin acts somewhat slowly, and it seems that its action is similar to that of vanillin, being slower probably because its two oxy groups are closed together.

Methylanthranilate seems to act as an aminic inhibitor.

The acid values or free alkali contents (as % NaOH) in Table 1 have been determined after 300 hours of exposure, and it will be seen that most of the strongly oxidized soaps were either neutral or even slightly alkaline. A few of them developed a slight acidity. On the other hand, the soaps whose oxidation was inhibited also varied in their reaction. Thus, the soap with vanillin had a relatively high acid value (caused by the acidity of the vanillin itself) while the ones with eugenol, coumarin, and methyl anthranilate still retained some free alkali.

These series of experiments show again quite clearly that there is no need to suppose that a prior splitting-off of free fatty acid is necessary for the development of autoxidation and rancidity. The fact that soap oxidizes as such has been proved even more convincingly through an experiment where soap with 8% free alkali has been found to contain very high *peroxide* values (6).

Combination of Vanillin with Other Aromatics

It is probably worth mentioning, in connection with the above experiments, that in the perfuming practice combinations of vanillin with other aromatics have been tried in soaps (7) with the intention of avoiding the darkening effect. It is to be seen how such combinations behave in soaps in regard to their inhibitive action.

Summary

1) Nineteen aromatic chemicals have been tested for their influence as inhibitors or accelerators in soaps.
2) Three compounds of the eugenol group, and one amino-compound have been found to be active inhibitors.
3) Their activity was found to be in direct proportion to their darkening effect on soap.
4) Vanillin is an inhibitor in soaps and an accelerator in oils.
5) Constitutional explanations for the activity of the above inhibitors are put forward.

REFERENCES

1) Anon., The Givaudanian, March, 1941.
2) E. J. Better, Chemiker-Zeitung *46*, 549-560 (1932).
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4) Soap *8*, Sept., pp. 59-60 (1932).
Soap *8*, Oct., p. 53, Eric C. Kunz.
5) E. J. Better, Seifensieder Ztg. *59*, 235-238 (1932).
6) E. J. Better and A. Davidsohn, Oil & Soap *22*, 325 (1945).
7) O. Gerhardt, Seifensieder Ztg. *58*, 467 (1931).

Report of the Cellulose Yield Committee for 1945-46

DURING the past year the committee's work was divided into two parts. Part one was routine checking of yield analyses from different laboratories. Part two was improvements in the method.

PART 1

During the year five samples were sent out to eleven laboratories. In some cases all the analyses were not returned so only the laboratories included in this report are the ones which returned the five sets of analyses. These are given in the following table:

Lab. No.	No. sets samples tested	Samples A Linters	Samples B Linters	Samples C Fiber	Over-all average for year
1	5	77.3	74.3	71.1	74.2
2	5	77.8	74.6	**70.9**	74.4
3	5	76.9	73.7	70.1	73.6
5	5	77.1	74.2	71.4	74.2
6	5	77.3	73.8	70.5	73.9
9	5	77.7	74.6	71.3	74.5
10	5	77.9	74.6	71.4	74.6
11	5	77.6	74.6	71.0	74.4
12	5	77.6	74.2	70.7	74.2
Average		77.5	74.3	70.9	74.2

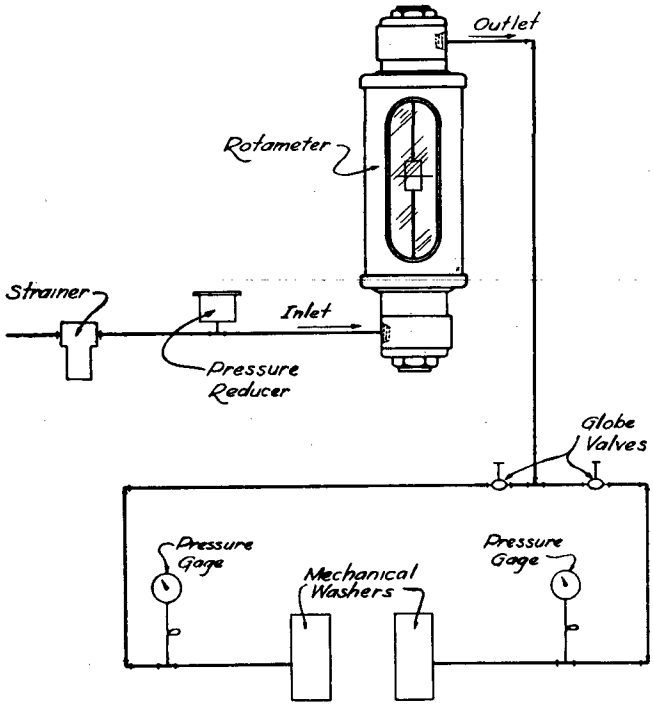
It is noted from the above table that the results are fairly consistent and within the experimental error of the method.

PART 2

Improvement 1—It was suggested that we add a wetting agent to the caustic in order to get a more uniform wetting of the lint before digesting. In order to determine the effect on the yields of this step, three lint samples were sent out to the members of the committee along with the sample of red oil to be used as a wetting agent. The following table gives the yields of the lint with and without the red oil in digesting.

Lab. No.	A Red Oil	A No Red Oil	B Red Oil	B No Red Oil	C Red Oil	C No Red Oil
1	77.7	77.9	73.2	73.2	72.6	72.2
2*	....	....	74.6	74.7	73.4	72.6
3	77.6	78.1	73.4	73.5	72.1	72.3
4	77.3	77.3	72.2	72.3	71.8	71.6
5	78.6	79.0	73.5	73.5	73.2	73.5
6	78.6	78.6	74.4	74.1	72.3	72.4
Average	78.0	78.2	73.3	73.3	72.4	72.4

* Poor results due to other reasons than wetting agent. This laboratory is not included in the average.



(Courtesy of Virginia Cellulose Division, Hercules Powder Company)

Installation of Rotameter on Mechanical Washers

It is seen from the above results that the wetting agent does not affect the yield of the lint. One-half c.c. red oil is added to each 525 c.c. of 1% caustic cooking solution.

Improvement 2—It was also suggested that we use a rotameter to measure exactly the amount of water used in washing the sample. The committee thought this was a good suggestion and we found that no work was required to approve the recommendation of the installation of the Fischer & Porter, No. 6 Master Enclosed Rotameter, Catalog Style Figure 735-P.

Recommendations

It is recommended:

1. That samples be sent out during the next year for the yield check analyses at least five times during the season.
2. That the method be changed to include the option of the use of red oil in wetting out the lint before digesting. These changes have been made in the Standard Analytical procedure which is attached.
3. That the Fischer & Porter Rotameter be installed as given in the attached sketch.

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Constant Pressure Oxygen Absorption Fat Stability Test

(General Foods Method)

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Introduction

TESTS for measuring fat stability depend upon two factors, namely, one which imposes the accelerating conditions and the other which measures development of rancidity. In the oxygen absorption method the fat is subjected to an elevated temperature in the presence of an atmosphere of oxygen and the development of rancidity is determined by the volume of oxygen absorbed. The oxygen absorption method was used as early as 1924 (1).

References to subsequent modifications in the method were summarized in 1937 by one of the authors (2). A popular adaptation of this method to conventional equipment (Barcroft-Warburg apparatus) appeared in 1941 (3). Further adaptation of this apparatus was made in 1944 in which an emulsion of the fat is used as the sample (4).

The method to be described in the present paper is similar in principle to that which was used in studying the oxygen absorption of coffee oil (loc. cit. 2) and it differs from that published by Johnston and Frey (loc. cit. 3) in the following respects:

a) oxygen is absorbed under constant pressure and recorded volumetrically on a macro scale;
b) induction periods can be evaluated graphically from the direct plot of the experimental data without further calculation.

Method of Operation

Details of the individual burette are shown in Figure 1 and the manner in which the unit is mounted on the conventional Barcroft-Warburg stand for filling the apparatus with oxygen is shown in the photograph, Figure 2. Each unit carries its own mercury reservoir at a substantially constant level and the volume of oxygen absorbed is followed by measuring the equivalent volume of mercury accumulated in the bottom of the burette as a function of time.

All glassware is scrupulously cleaned by the following treatment:

a) degreasing with carbon tetrachloride;
b) soaking in boiling hot alkaline detergent solution and rinsing;
c) soaking in chromic-sulfuric acid cleaning solution overnight;
d) rinsing three times with tap water, twice with distilled water, and drying in a vacuum oven.

This cleaning procedure is applied regularly to the 50 cc. round-bottom oxidation flasks and transfer