J. J. VOLLERTSEN

The motion was voted upon and carried.

"The other recommendation had to do with the determination of silicates in soap. The question of the factor to be used in converting silica, SIO_2, to sodium silicate was taken up by the committee and decided. The present factor, as shown in the methods, is 1.26, corresponding to a ratio of approximately 1.0 to 3.85. It was the opinion of the committee that the factor should be changed to 1.308, which, incidentally, corresponds to the ratio of NA_2O to SIO_2 in N brand silicate. I might explain that the factor now in the method is one that has been in there for many years.

"The Uniform Methods Committee approves this change, and I move, Mr. Chairman, that it be adopted by the Society."

The motion was seconded, voted upon, and carried . . .

"There was just one other report that came before us, and that was the report of the Committee on Sulphonated Oils. They have done a great deal of work and they came in with a recommendation for the adoption of two methods for determining moisture in sulphonated oils. The first one is a distillation method and the second is the hot plate method, similar to that in use by the Fat Analysis Committee. I do not believe I should take time to read the details of these methods, as they are rather lengthy, and I believe you heard them in reports delivered yesterday."

"The Uniform Methods Committee approved these two methods, and I move, Mr. Chairman, that they be adopted as tentative methods for the Society."

The motion was seconded, voted upon, and carried . . .

"That concludes my report."

REPORT OF THE CHAIRMAN OF COMMITTEE FOR THE STUDY OF PAPER AND INKS USED IN SOAP WRAPPERS*

By L. F. HOYT

Larkin Co., Inc., Buffalo, N. Y.

Collaborative work attempted by this committee this year comprised tests for alkali resistance by two methods on four different kinds of paper and two printed soap wrappers, and the effect of freshly cut soap on the same printed soap wrappers.

The composition of the papers used in this collaborative work was as follows:

Paper No. 1, ⅔ sulphite, ⅓ old papers stocks, 2% size.

Newsprint, groundwood stock. (Note: It is recognized that newsprint paper is very sensitive to discoloration with alkali. This sample is included, however, as an example of a type of paper which would be entirely unsuitable for use in wrapping soap.)

Paper No. 3, high grade vegetable parchment.

Paper "A-P," ¾ bleached sulphite, ¼ soda stocks. Part of the stock used is de-inked book stock and the finished paper contains traces of rag and ground wood, although it has good resistance to alkali and is sold as an alkali-proof paper.

No. 1, Newsprint, and No. 3 are respectively Standard Papers Nos. 1, 2, and 3 used by the Soap Wrap Committee of the Technical Association of the Pulp and Paper Industry in their 1934 collaborative work. Newsprint and Paper No. 1 samples were kindly furnished by Mr. T. Linsey Crossley, Chairman of the T.A.P.P.I. committee, and Paper No. 3 was supplied through the courtesy of Mr. F. D. Libby of the Kalamazoo Vegetable Parchment Co.

The soap wrappers used in these tests were printed each with one color only on the A-P paper. One wrapper was printed with a green ink supplied as an "alkali-proof ink." The other wrapper was printed with an ink supplied by the manufacturer as "soap-proof" after satisfactory contact test with a filled white laundry soap.

L. F. HOYT

*A report read at the 8th Fall Meeting of the American Oil Chemists Society in Chicago, October 11, 1934.

The chairman regrets that he was unfortunately delayed in sending the collaborative samples to members of this committee. In spite of the short time available, however, five members submitted reports of the work. The tabulated results are as follows:

OUTLINE OF COLLABORATIVE WORK

Methods of Testing Soap Wrappers Used by the 1934 Committee

1. Spot test with caustic soda, according to procedure communicated to chairman by Dr. Ittner, who gives the following details and comments on his spot test:

"Place the material to be tested on a flat clean surface and mark off several areas with a lead pencil so that each area will have some of each kind of ink or color and some of the unprinted paper.

RESULTS BY COLLABORATORS

1. Spot Test with Caustic Soda Solutions (Procedure of Dr. Ittner).

Paper No. 1—⅔ sulphite, ⅓ old paper stocks:

Laboratory	Strength of Caustic Soda Solutions ¼%	½%	1%	2%
1	Very slight	Slight	Distinct	Marked
2	¼% stains	.....	.....	.....
3	Slight	Marked	Pronounced	Pronounced
4	Slight, incr. in intensity to marked yellow with 2%			
5	Very slight, O. K.; ½% and stronger stains			

Paper No. 3—Vegetable Parchment:

Laboratory				
1	Very slight	Very slight	Very slight	Very slight
2	.....	.....	1% stains slightly	2% stains
3	None	None	None	Slight (O. K.)
4	Very slight, increasing in intensity to marked yellow			
5	Very slight, O. K.; ½%, and stronger, stains			

Newsprint—Groundwood—

Laboratory				
1	Marked	Marked	Marked	Marked
2	Stains in all concentrations			
3	Slight	Yellow	Deep yellow	Very deep yellow
4	Slight yellow, increasing in intensity with concentration			
5	Stains in all concentrations			

Paper A-P—75% Bleached Sulphite, 25% Soda, traces of Rag and Groundwood Stocks:

Laboratory				
1	Very slight	Very slight	Very slight	Slight
2	Stains, very slightly	Stains	.....	.....
3	Slight	Slight	Noticeable	Pronounced
4	Very slight, increases in intensity with concentration			
5	Very slight	Stains	.....	.....

Printed Soap Wrappers—Strength of caustic which affects ink and paper stock:

I. Blue printed:

Laboratory	Ink	Paper
1	2% slight	½%, slight
2	No effect by 2%	½%, visible stain
3	2%, ink faded	1%, discolored
4	2%	½%
5	2%	½%

II. Green printed:

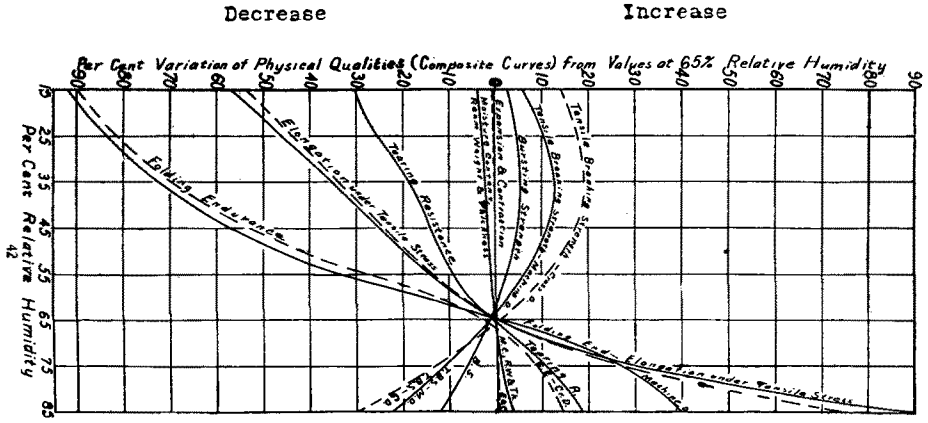
1	Ink carried through sheet by 2%	½%, slight
2	No effect up to 2%, but 2% caused ink to pass through sheet	½%, visible stain
3	2%, ink faded	¼%, slight discoloration
4	1%	¼%
5	½%	¼%

2. Extraction Method (Method of Mr. Crossley):

Laboratory	Paper Samples No. 1	No. 3	A. P.	Newsprint
2	1.0	0.4	0.4	2.2
3 (check texts)	0.5-0.7	0.2-0.3	0.2-0.3	1.7-1.9
4	0.5	0.4	0.4	1.2
5	0.6	0.3	0.25	2.0
T. A. P. I. Committee; range of texts by 4 members....	0.3-0.7	0.2	...	1.35-2.0

3. Effect of freshly-cut soap on printed soap wrappers (16 hrs. at room temperature under pressure of 2 lbs. 1 sq. in.).

Laboratory	Type of Soap Used in Test	Effect on Soap Wrapper, (a) Blue Printed	Ink and Paper (b) Green Printed
2	White Floating 0.04% NaOH	No effect on ink Paper discolored	Ink decolorized Paper discolored
3	White Laundry 41.3% Volatile 0.04% NaOH 13.3% Sod. Silicate	No fading, bleeding or transfer of ink through paper	Faded badly
4	White Laundry 41.4% Volatile 13.1% Sod. Silicate	No fading or bleeding Paper slightly discolored on reverse side	Ink fades badly Paper discolored yellow
5	White Laundry 43.0% Volatile 0.01% NaOH 14.4% Sod. Silicate	No fading or bleeding of ink Paper slightly yellowed	Ink decolorized Paper appreciably yellowed



VARIATION IN PHYSICAL PROPERTIES OF PAPER WITH CHANGES IN HUMIDITY

"Mark each area according to the strength alkali used in testing it. Apply one drop of alkali with a glass rod or preferably a medicine dropper to each different kind of ink and to the unprinted paper, taking care not to spread the drop. Avoid moving the paper during the test.

"Test the different areas in turn using ¼, ½, 1, and 2% caustic soda solutions. Wash the glass rod or medicine dropper thoroughly with clean water before changing from one strength alkali to another. Indicate the places where the drops are applied by penciled arrows pointing towards the drops. Allow the paper to stand undisturbed until dry.

"Interpretation of results: After the alkali drops have been allowed to dry spontaneously on the papers, observe carefully the effect of the different strength alkali solutions on each color and on the paper. Note in writing, with respect to each strength and each color, if the alkali has produced a harmful change, recording as O.K. the strongest solution of alkali used that does not produce a harmful change.

"Record should also be made as to whether reverse side of paper is affected, by what colors and by what strengths of solution.

"Notes: By allowing a small drop of caustic soda of known strength to lie quietly in contact with the paper or ink until absorbed and dried, conditions are employed which are easily reproduced. It is true that as the water of the drop evaporates the solution becomes somewhat more concentrated. But this same variation in the strength of the alkali employed is present in any test which involves liquid alkali. If the excess is removed by flirting it from the paper the results will be more or less irregular and if it is removed by means of a blotter the alkali may not have had sufficient time to cause the change that it will in actual use. It must be remembered that soap lies in contact with paper and ink for a long time and the amount of moisture in a closed box that comes in contact with the soap and paper is quite variable.

"Tests made by the procedure described above show very definite limits, on one side of which a given paper or given ink will appear to be satisfactory and on the other side of which it may be unsatisfactory. This method gives an easy way of comparing the relative resistance of two or more papers or two or more inks."

2. Extraction of soap wrapper paper with distilled water and estimation of the color produced when caustic is added to the extract, as outlined by Mr. Crossley as follows:

Three grams of paper sample is boiled in two successive lots of 50 cc. distilled water for five minutes each. Combine the extracts and make up to 100 cc. To 20 cc. of extract add 5 cc. of normal caustic soda. Compare the color produced with standards of equal volume containing measured amounts of a standard color solution containing 0.5 grams potassium dichromate and 5 cc. of a 0.1% solution (i.e., 5 milligrams) of Congo Red per liter.*

Use 50 cc. Nessler tubes for the color comparison. Report number of cc. standard color solution required to match the color of the 20 cc. extract. (Note: From 0.2 cc. to 2.5 cc. of standard color solution should cover the range of colors produced with the papers submitted.)

3. Effect of freshly cut laundry soap on printed soap wrappers, in accordance with type of test suggested by Mr. Sheely:

Use freshly cut laundry soap and place soap wrappers between two freshly cut surfaces of soap. Place the bars of soap under a weight approximating 2 lbs. per square inch for a period of about 16 hours at room temperature. After this treatment examine papers for discoloration, bleeding and transfer of inks.

Note: For this test collaborator may use any brand of laundry soap he desires. A white laundry soap should preferably be used. This test is admittedly difficult to standardize. It would be desirable for interpretation of results in this preliminary work to give if possible the approximate analysis of the soap used, as regards amount of free alkali if any, filler, and proportion of rosin in case a yellow laundry soap is used.

Discussion of Methods and Results

A survey of the data reported shows considerable variation in the results obtained by different collaborators with the spot test for alkali resistance. The spot test, while valuable because it furnishes a visible and permanent record on the paper itself, is not well adapted to study by a committee because it is very difficult to interpret the results in the absence of any standards—either of description of the discoloration produced, or of secondary color standards.

Results by the extraction method are more consistent. This method has the advantage that results can be expressed numerically. (The consensus of opinion of members of the T.A.P.P.I. Soap Wrap Committee was that a color equal to 0.5 cc. of the standard color solution might be tentatively considered the allowable limit for a paper to be classed as alkali-proof.) It was pointed out by two members of this committee that colorimetric readings by control of height of column are less liable to error than control by volume, and that Nessler tubes of specified diameter should be used for this test.

The soap contact test is also a type of test which is difficult to

*Note: Results have indicated that it will be necessary to revise this color standard slightly, in order to secure a closer match, by decreasing the amount of Congo Red to be used and by specifying the brand or source of the Congo Red.

standardize. The results obtained in this collaborative work, however, demonstrate its value. The results, by all those who reported, consistently indicated (1) that the blue-printed soap wrapper would be satisfactory and (2) that the green-printed wrapper would be unsatisfactory in use. These results have been amply and positively confirmed by factory experience with these wrappers in use.

The collaborative results show positively and clearly that

(1) Vegetable parchment paper and the A-P paper have a reasonably satisfactory resistance to alkali.

(2) Newsprint paper would be entirely unsuitable for use as a soap wrapper.

(3) The blue ink on blue-printed wrapper is resistant to alkali and to contact with freshly-cut soap.

(4) The green ink on green-printed wrapper is not resistant to freshly cut soap, although some collaborators found it reasonably alkali-resistant.

Recommendations

The Committee recommends that the methods used in testing soap wrappers in this 1934 collaborative work be published as a part of this report, but feels that more work should be done with these methods before they can be recommended even as Tentative Methods of the A.O.C.S.

The spot test and the extraction method for alkali resistance should be studied further.

The method of color comparison in the extraction method should be more rigidly standardized and the color standard investigated to determine if a closer match may be secured.

Correlation between the results of the spot test or the extraction method, and satisfactory use is most important. A soap contact test should be made on the same plain papers which are used for spot and extraction tests with at least three types of white soap, for example a white floating soap, a white filled laundry soap, and a freshly pressed milled toilet soap.

If it is possible to secure an additional supply of soap wrappers from any source which are known by factory experience to give either satisfactory *or* unsatisfactory results in use it would be very desirable, in the opinion of this committee, to use such wrappers in subsequent collaborative work.

Other forms of soap contact tests suggested by members of this committee should be tried. Mr. A. E. King of Swift & Co. suggests the following procedure: Place the wrappers between white blotters saturated with a 0.2% solution of coconut oil soap, piling up blotters and wrappers to make a pad about ½" thick. Place under a bell jar, containing a dish of water to maintain a saturated atmosphere, above a steam bath for 16 hours. Examine the blotters and wrappers for fading or bleeding of colors. Mr. H. C. Bennett of Los Angeles Soap Co. suggests a test which he has found gives results comparable to actual storage conditions, viz.: Three bars of soap wrapped with the soap wrapper under test are wrapped and tightly sealed in moisture-proof cellophane. Place in a warm oven maintained at 110-115° F. for a period of one week. During this time a weight on top of the soap develops the pressure which would ordinarily result at the bottom of a pile of soap in a warehouse. At the end of this period the soap is placed in an ice chest for two hours, then replaced in the oven for two hours more and then placed back in the ice chest for another hour. This develops sweating and gives results which are somewhat indicative of what may be expected in practice. Mr. Bennett states the unfavorable results by this test can be depended upon to correlate with unsatisfactory results in use.

Members 1934 A.O.C.S. Committee for the Study of Paper and Inks Used in Soap Wrappers

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EFFECT OF COTTONSEED MEAL ON STABILITY OF VITAMIN A IN COD LIVER OIL*

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Vitamin A is necessary for maintaining a satisfactory state of nutrition and a high degree of health. Like other important factors, its deficiency in the diet will lower the vigor of the body and its ability to resist disease; therefore the incident of any number of diseases may be the result of inadequate amounts of vitamin A in the diet. This vitamin is sometimes referred to as the anti-infective vitamin, but experimental evidence is not sufficient to regard vitamin A as positive anti-infective agent, indiscriminate in its action.

One of the common and highly potent sources of vitamins A and D is cod liver oil, and it has now become a very common and rather extensive practice to incorporate cod liver oil into commercial feed mixtures, particularly poultry feeds where it is primarily desired to increase the vitamin D content of the ration. Various investigators,[1,2,4] reporting on the stability of vitamin D in cod liver oil-feed mixtures, have varied in their conclusions. This has probably been due to a variation in the conditions of the experiment and the failure to determine the minimum protective doses. Vitamin A, although relatively less stable than vitamin D, has received little attention as to its stability in cod liver oil-feed mixtures. Marcus[3] reported an appreciable loss of vitamin A potency when cod liver

*A paper presented at the 8th Fall Meeting of the American Oil Chemists Society in Chicago, October 11, 1934.