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DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
WASHINGTON, D. C.

Letter
Circular
LC 338

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DETERGENTS AND CERTAIN DETERGENT AIDS

This letter circular has been prepared as a result of the numerous requests received by the Bureau of Standards for general information regarding detergents and detergent aids.

Soaps, Cleaners, Washing Powders.-

Bureau of Standards Circular No. 383, "Washing, Cleaning, and Polishing Materials", discusses briefly the chemistry of soap making, describes the various types of soap products in common use, and outlines some of the manufacturing processes. This circular also briefly discusses the use of water in laundering, cleansing action, alkaline cleansers, bleaches, laundry sours, bluing, starch, dry cleaning, polishes, etc. It may be procured at ten cents per copy (stamps not accepted) from the Superintendent of Documents, Government Printing Office, Washington, D. C. Bureau of Standards Letter Circular 247, forwarded herewith, lists the Bureau's publications on detergents and the Federal Specifications covering such products and states how these publications may be obtained.

The various reference books on soap manufacture give formulas for making various soaps and detergents and describe the operations involved and the equipment required. These books, some of which are listed at the end of this circular, also describe the raw materials used, the various processes of saponifying oils or fats, recovery of glycerin, etc.

Numerous inquiries are received about the small-scale manufacture of soap from kitchen or garbage grease. The quality of the soap depends not only upon the character of the grease used but to a considerable extent on other materials and the process employed. Soap made from kitchen grease is generally softer and darker in color than that made from tallow. Preliminary trials might be made with the small-scale formula given on page 20 of Circular No. 383.

It should be noted that soap making is a chemical process and requires careful chemical control and special equipment in order to produce a high grade, completely saponified product containing no free alkali. We would suggest that a competent chemical engineer be consulted before attempting to make soap on a commercial scale.

It is our opinion that it is more economical to buy ready-made soap than to attempt to manufacture it on a small scale or in a crude way. This is especially true if a high grade of soap is desired. It might be noted that a Research Bureau of the American Hotel Association in a pamphlet entitled "Hotel Soaps and Cleaning Compound" (dated June, 1923) advises against hotels attempting to manufacture soap from greases and scrap fats, and recommends that such waste products be sold to a soap manufacturer or exchanged for soap. This publication also states that the attempted manufacture of soaps by hotels has not proved satisfactory or economical.

The Bureau is frequently asked to state "what is the best detergent to use in a dish-washing machine". It is our understanding that trisodium phosphate, sold under various trade names, is in general use for this purpose. Ordinary soap powder, soda ash, monohydrate sodium carbonate, so-called "powdered ammonia", sodium metasilicate, mixtures of trisodium phosphate with other compounds, and probably other mixtures or compounds may be used in dish-washing machines. However, we are unable to furnish any definite information as to the relative extent to which such products may be in use for the purpose in question. It is probable that the various branches of the Government use one or more of the detergents covered by the Federal Specifications listed in the inclosed Letter Circular 247. The Bureau of Standards has not conducted any tests with dish-washing machines and, therefore, we are unable to state from first-hand information what is the most efficient detergent to use in such equipment.

Bluings.--

The most common substances used in laundry bluing are indigo, Prussian blue, ultramarine, and aniline blues (coal tar dyes), the last two being used principally in solid bluing. As a rule, the most satisfactory materials for bluing are indigo and aniline blue, which are not readily affected by weak alkalies or acids. Prussian blue is decomposed by even weak alkalies, such as ammonia, and may thereby produce rust spots on the clothes. The aniline blues are in general use in the power or steam laundries in this country.

A discussion of laundry bluing, including directions for using them in the laundry, will be found in the book "Manual of Standard Practice for the Power-Laundry Washroom". This book is issued by and may be obtained from the Laundryowners' National Association, Drawer No. 202, La Salle, Ill. The Laundry Research Department, Procter & Gamble Company, Cincinnati, Ohio, has issued a booklet entitled "The Washroom", which discusses laundry bluing and their application. The Cowles Detergent Company, 7016 Euclid Avenue, Cleveland, Ohio, has also issued a bulletin on bluing in laundry operations. U. S. Department of Agriculture Farmers' Bulletin No. 1497, "Methods and Equipment for Home Laundering", may be procured at five cents per copy (stamps not accepted) from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Chlorine Bleach (Sodium Hypochlorite).--

The various books on applied or industrial chemistry contain information on the manufacture, properties, and uses of sodium hypochlorite. Among such books are Thorpe's "Dictionary of Applied Chemistry", and Molinari's "General and Industrial Chemistry". The Hooker Electrochemical Company, Niagara Falls, N. Y., has probably issued a bulletin on bleach solution.

Information on bleaching, with directions for preparing "Javelle water" will be found on pages 26 and 27 of U. S. Department of Agriculture Farmers' Bulletin No. 1497 above referred to. On page 224 of the Tenth Decennial Revision of the United States Pharmacopoeia will be found a formula for preparing "U.S.P. Solution of Chlorinated Soda" (sodium hypochlorite). This book is available in many libraries and drug stores.

The preparation and uses of sodium hypochlorite and other bleaches in the power laundry, their action on fabrics, and methods of analysis are described on pages 56 to 75 of the second edition of the "Manual of Standard Practice for the Power-Laundry Washroom" above referred to.

On pp. 845-847 of the August 1923 issue of Industrial and Engineering Chemistry (Vol. 15), will be found an article on the preparation of a stable sodium hypochlorite solution (data are given showing percentages of available chlorine after various time periods).

Household Ammonia.-

Information on "household ammonia" and on so-called "powdered ammonia" is given in Bureau of Standards Circular No. 383, on "Washing, Cleaning, and Polishing Materials" (mentioned on the first page of this letter circular).

In the preparation of dilute ammonia solution (or household ammonia) from anhydrous ammonia or concentrated ammonia water, a soft water should be used, preferably distilled water.

The Bureau of Standards has not issued or developed formulas for making cloudy household ammonia. We are unable to advise as to all of the materials that may have been used to impart cloudiness to ammonia solutions. They generally contain a small amount of soap and one or more salts, such as: borax, sodium carbonate, potassium carbonate, or potassium nitrate. A small amount of alcohol is sometimes added to produce cloudiness or to increase turbidity.

The Bureau of Standards has not issued a publication giving recommended formulas for or describing in detail the manufacture of various detergents and detergent aids, nor has it issued a publication containing reports of analyses or tests of commercial detergent products. The Bureau does not issue or maintain an "approved" or a "not approved" list of these products, and we know of no Government publication containing such data.

Information on the detergent and soap industry, including manufacturers of machinery, may be obtained from the journal "Soap", published by MacNair-Dorland Company, Inc., 136 Liberty Street, New York City.

References.-

Thomssen, E. G.: Soap-Making Manual, D. Van Nostrand Company, New York City.

Meerbott and Stanislaus: American Soap Makers' Guide. Henry Carey Baird & Co., New York City.

Lamborn, L. L.: Modern Soaps, Candles and Glycerin. D. Van Nostrand Company, New York City.

Martin, Geoffrey: The Modern Soap and Detergent Industry. Crosby Lockwood and Son (London).

- Webb, E. T.: Soap and Glycerine Manufacture. Davis Bros.
(London).
- Deite, C.: Manual of Toilet Soap Making. D. Van Nostrand
Co., New York City.
- Brannt, Wm. T.: The Soap Makers' Hand Book. Henry Carey Baird
and Company, New York City.
- Mitchell, R. W.: Castile Soap. Monograph published by
Lockwood Brackett Company, Boston, Mass.
- Matthews, J. M.: Bleaching and Related Processes. The Chemical
Catalog Company, Inc., New York, N. Y.
- Townsend, C. F.: Chemistry for Launderers, Also for Cleaners
and Dyers. Nat'l. Laundry Journal, Chicago, Ill.
- Jackson, D. N.: The Chemistry of Laundry Materials. Longmans,
Green and Company, New York, N. Y.
- Polleyn, Frederick: Dressings and Finishings for Textile
Fabrics and Their Application. Scott,
Greenwood and Son, London.
- Harvey, A.: Laundry Chemistry. The Chemical Catalog Company,
Inc., New York, N. Y.
- Chambers, Mary D.: A Guide to Laundry Work. The Boston Cooking-
School Magazine Co., Boston, Mass.
- The Woman's Institute of Domestic Arts and Sciences, Scranton, Pa.
Laundering and Dry-Cleaning.
- Wetenhall, Louise: Practical Laundry Work for Home and School.
E. P. Dutton and Company, New York, N. Y.
- Hopkins, A. A.: Scientific American Cyclopedia of Formulas.
Munn & Company, Inc., New York City.
- Henley: Twentieth Century Book of Recipes, Formulas, and
Processes. Norman W. Henley Publishing Company,
New York City.
- The Pharmaceutical Recipe Book. J. B. Lippincott Company,
Philadelphia, Pa.

Brannt-Wahl: Techno-Chemical Receipt Book. Henry Carey
Baird and Company, New York City.

The journal "Chemical Abstracts" gives abstracts of articles on chemistry and related subjects that are published all over the world. It also cites patents issued in this and other countries. In the two decennial indexes, 1907 to 1916, and 1917 to 1926, and in the annual indexes since the last date, there are numerous entries relating to detergents.

In referring to the publications listed in this letter circular no guaranty is expressed as to the formulas or processes therein nor are they recommended over others on the same subject. They are simply given for the reader's convenience in case he wishes to consult such publications.

