

PRACTICAL and INDUSTRIAL FORMULARY

MITCHELL FREEMAN, Met.E.

Mitchell Laboratories

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Practical and Industrial Formulary

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Preface

This volume is a collection of new, modern, up-to-date formulae. The purpose of this work is to provide authentic, concise, and practical information of interest to all—laymen and technologists. It is a condensed, comprehensive, and reliable cyclopedia of formulas for the chemist, pharmacist, and those in allied professions. It is intended to fill a definite need of the manufacturer, teacher, student, and layman. Here, in one handy volume, is a wealth of new formulas and methods you can put right to work. No other book like it has been published. Most of the formulae may be varied to suit everybody's fancy.

This practical book offers you information equal to the services of a private staff of experts on many problems. The formulas in it are entirely practical—the kind you can put to use right away. Most of the formulas have been carefully selected, tested, and thoroughly researched by technical men.

To the thousands of professional workers for whom this book is intended, I extend my hope that it will prove to be a dependable and useful source of information. It is my sincere desire that this book will prove to be a significant contribution to the making of better things.

In keeping up with the times in this streamlined age, one is helped by various "digests" which one has come to require as first aids to one's knowledge. It is wise to know a little something about almost everything, hence one seizes upon the paper-covered things that give much in little.

I wish to acknowledge my indebtedness to the various government and scientific publications for much useful information.

Critical and constructive comments and suggestions from the users of this book will always be welcomed by the author.

This volume comprises a comprehensive Buyer's Guide, and it is hoped that this arrangement will enable users to find quickly an answer to their supply problems.

1962

Mitchell Freeman, Met.E.

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Adhesives

Adhesive for Cellophane Films

	<i>oz</i>
Gum arabic, best grade	11.0
Glycerin	11.0
Glyceryl borate	9.0
Formalin	3.0

Mix the gum arabic with the glycerin and use gentle heat to effect complete solution. Finally, add the glyceryl borate, and formalin, and shake well.

Glue for Bookbinding

Skin gelatin	4.0 lb
Boiling water	3.0 lb
Glycerin	1.8 lb
Betanaphthol	10.0 oz
Alcosolve 2	10.0 oz

Dissolve the gelatin in the boiling water. Mix the betanaphthol with the glycerin and heat gently to effect solution. Mix the two solutions and shake well. Finally, stir in the Alcosolve 2.

Glue, Flexible

Skin glue, powdered, good quality	10.0 lb
Water	64.0 oz

Glycerin	2.5 lb
Sugar, granulated	2.3 lb
Betanaphthol	1.6 oz
Isopropyl alcohol, 88%	2.4 oz

Mix the first 4 ingredients, and beat until solution is complete. Allow it to cool and stir in the betanaphthol, previously dissolved in the alcohol. Put up in suitable containers. The resultant glue has extremely good tack and flexibility, it possesses excellent adhesive properties as well as flexibility.

Paste for Offices

White potato dextrin	5.0 lb
Boiling water	7.5 lb
Borax	6.8 oz
Glyceryl borate *	3.2 oz
Formalin	0.8 oz
Phenol	0.8 oz

Dissolve the dextrin in the boiling water. Stir in the borax and glyceryl borate. Finally, add the formalin and phenol, and shake well.

* Glyceryl Borate

	<i>parts</i>
Boric acid	12.4
Glycerin	36.8

Dissolve the boric acid in one half of the glycerin at 150°C. When solution is complete, add the other half of the glycerin and shake well.

Paste for Labeling Tin

	<i>lb</i>
White potato dextrin	1
Gum arabic solution, 20%	5
Boiling water	16½
Flake calcium chloride	1¾
Glycerite of starch *	1

Dissolve the dextrin in the boiling water. Add the calcium chloride and shake well. Finally, stir in the gum arabic solution and the glycerite of starch.

* Glycerite of Starch

Starch	1.27 oz
Distilled water	2.27 oz
Glycerin	11.30 oz

Make a slurry of the starch in the distilled water. Pour this slurry gradually with stirring into the glycerin at 140°C. When the frothing has subsided, keep the temperature at 135°C. and stir the gel until it becomes translucent.

Peel Paste

Mix suitable proportions of the following ingredients:

Methocel (methyl cellulose)

Glycerin

Water

The setting time of this adhesive can be adjusted by varying the amount of the glycerin. It is used in place of usual starch pastes in applying wallpaper to hard surfaces. This adhesive holds the paper in place for as long as required, and it can be stripped off easily when so desired.

Waterproof Cement

	<i>oz</i>
Lead monoxide, yellow, powdered	16
Glycerin	2½
Water	1
	<i>or</i>
Lead monoxide	16
Glycerin	4
Water	1¾

Mix the glycerin with the water. Add the lead oxide, and mix thoroughly. The amount of water may be varied, depending on the rate of set desired. The resultant product yields a fast-setting, hard, waterproof cement which will adhere firmly to china, glass, iron, stone, wood and other materials.

Cleaning Preparations

For Aluminum

	<i>oz</i>
Trisodium orthophosphate	42.0
Sodium metasilicate, anhydrous	36.0
Soda ash	24.0
Alkyl aryl sodium sulfonate, 85% active	12.0
Tetrasodium pyrophosphate, anhydrous	6.0

Mix thoroughly and put in suitable containers. This product is satisfactory for precleaning metal specimens.

For Brass, Copper, and Bronze

	<i>oz</i>
Sodium dichromate	47.36
Sulfuric acid, 66°Bé	11.52
Water	69.12

Dissolve the dichromate in the water, add the sulfuric acid and shake well. Avoid contact of the substance with hands or any other part of the body, especially the eyes. This product will remove the superficial discoloration, thus restoring the original appearance and color of the metals.

For Cars (Paste)

	<i>oz</i>
Teepol (higher alkyd sulfate) *	75.0
Bentonite, white	30.0
Infusorial earth	45.0
* 30% active secondary fatty alcohol sulfate.	

Heat the Teepol and stir in the powders. Continue to stir until a smooth paste is obtained. Put up in suitable containers. Rub the paste on the surface of the car, then rinse it off with water.

For Cars (Shampoo)

	<i>oz</i>
Dodecyl benzene sulfonate (40% active)	75
Sodium hexametaphosphate	22.5
Sodium sulfate, anhydrous	52.5

Mix the powders thoroughly and store in suitable containers. Make a 5% solution of this powdered compound in water, and apply to the body of the car with a rag or soft brush. Rinse the car with water from a hose.

For Dairy Pipe Lines

No. 1

	<i>lb</i>
Sodium tripolyphosphate, anhydrous	18
Trisodium phosphate, anhydrous	3.6
Soda ash	66
Sodium metasilicate, anhydrous	6
Sodium bicarbonate	14.4
Hyamine (germicide)	12

Have all the ingredients in a finely granulated form and mix thoroughly.

No. 2

	<i>oz</i>
Sodium hydroxide	4
Soda ash	14
Sodium metasilicate	100
Tripolyphosphate	70
Trisodium phosphate	12

Have all the ingredients in a finely granulated form and mix thoroughly. This now-sudsing mixture will minimize or prevent the formation of milk stone in glass pipe lines in dairies. The sodium hydroxide acts as a sanitizer; the trisodium phosphate as a water conditioner; and the metasilicate as a wetting and deflocculating agent. Do not handle the sodium hydroxide with bare hands.

Dishwashing Compounds

No. 1

	<i>lb</i>
Soda ash	48
Sodium metasilicate	54

Sodium tripolyphosphate	4.8
Trisodium phosphate	12
Wetting agent (Nekal BX)	1.2

Have all the ingredients in a finely granulated form and mix thoroughly.

No. 2

	<i>lb</i>
Sodium metasilicate	24
Sodium tripolyphosphate	18
Sodium carbonate	9
Trisodium phosphate	9

Have all the ingredients in a finely granulated form and mix thoroughly. The metasilicate acts as a suspending and dispersing agent, and also inhibits the corrosion of metals. As the tripolyphosphate has water-softening properties, it acts as a wetting and dispersing agent. The carbonate and trisodium phosphate augment the necessary alkalinity.

Dry-Wash for Hands

	<i>oz</i>
Stoddard Solvent *	64.00
Stearic acid	12.16
Triethanolamine	5.12
Hexalin	3.07
Lanolin	2.68
Water	40.97

* High flash point petroleum distillate.

Melt the stearic acid with the lanolin. Heat the triethanolamine and water to the same temperature, and pour slowly with constant stirring into the molten fats. When cool, stir in the Stoddard Solvent and Hexalin. Continue stirring until cold.

This preparation will remove oil, paint, grease, grime, tar and printer's ink from the hands.

Eyeglass Cleaner

Ammonium soap	6.40 oz
Glycerin	6.60 oz
Water, enough to make	1.00 gal
Fluorescein, soluble (D & C Yellow #7)	sufficient

Dissolve the soap in the water, add the glycerin and tint it with the fluorescein. Shake well. Place a few drops of this preparation on the eyeglass and wipe off clean with a soft cloth.

Glass Cleaner

	<i>lb</i>
Sodium sulfate	80
Sodium tripolyphosphate	33.34
Triton X-101	4
Trisodium phosphate	16

Have all the ingredients in powdered form and mix thoroughly.

Laundry Powder

	<i>lb</i>
Alkyl aryl sulfonate	30.00
Fatty alcohol ethylene oxide sulfate	10.00
Lauric ethanol	6.00
Sodium metasilicate	10.00
Sodium sulfate	30.00
Sodium tripolyphosphate	80.00
Tetrasodium pyrophosphate	14.00
Sodium carboxymethyl cellulose	1.00
Optical dye	0.06
Perfume and color	to suit

Have all the ingredients in a finely powdered form and mix thoroughly. The phosphates have detergent properties and act as dispersing and water-softening agents. The metasilicate inhibits the corrosion of metals. The sulfate is both a detergent and a diluent. The carboxymethylcellulose (CMC) assists in suspension of dirt.

Liquid for Floors and Walls

	<i>oz</i>
Coconut diethanolamide	49.00
Triethanolamine alkyl aryl sulfonate	28.00
Trisodium phosphate	14.00
Sodium tripolyphosphate	14.00
Water	4.65 gal

Mix all the ingredients and stir thoroughly until everything is dissolved.

Liquid Hand Soap

Coconut oil fatty acids	6 $\frac{3}{4}$ lb
Soya fatty acids	27 oz
Potassium hydroxide solution (50°Bé)	81 oz
Potassium chloride	9 oz
Distilled water	5 $\frac{3}{8}$ gal
Perfume oil	to suit

Put the fatty acids in a jacketed kettle equipped with a stirring apparatus, and heat at 65°C. Make a mixture of the potassium hydroxide solution, potassium chloride, and water, and heat to the same temperature. Pour the alkaline solution into the fats with constant stirring. Continue to stir until saponification

is complete. Stir in the perfume oil when the temperature is about 35°C. Use this soap in a dispenser in any public washroom. It may also be used for scrubbing floors. Use extreme care when handling potassium hydroxide (caustic potash).

Liquid Scrub Soap

Cottonseed fatty acid (sap. value 200)	4.95 lb
Pine oil	25.00 oz
<i>o</i> -phenylphenol	25.00 oz
Caustic potash 100%	15.84 oz
Water	4.00 gal

Mix the fatty acid, pine oil, *o*-phenylphenol, and heat at a low temperature. Dissolve the potash in the water and heat to the same temperature. Pour the potash solution into the fats with constant stirring. Continue to stir until saponification is complete. The pine oil increases the transparency of the finished product, and the *o*-phenylphenol imparts germicidal properties to it.

Metal Cleaner

	<i>oz</i>
Mineral spirits *	70.00
Triethanolamine	2.50
Oleic acid	5.00
Ethylene glycol monobutyl ether (Butyl Cellosolve)	1.25
Pine oil	19.50

* A petroleum product, intermediate between gasoline and kerosene.

Mix all ingredients thoroughly; add 10 or more volumes of water. Spray this mixture over the metal

surface to be cleaned. An extremely thin protective coating remains which prevents rusting over a period of several weeks.

Pine Oil Cleaner

	<i>oz</i>
Pine oil	6.40
Sodium carboxymethyl cellulose	0.60
Renex 20 *	12.80
Water	108.20

* Polyoxyethylene ester of fatty and resin acids.

Heat the water and dissolve the Sodium CMC in it. Add the Renex 20 and stir thoroughly. Finally, stir in with mild agitation the pine oil. Use about 2 oz of this cleaner to a gallon of water for cleaning bathroom floors, linoleum, tile, etc.

For Rugs and Upholstery

	<i>lb</i>
Oleic acid	15.12
Isopropyl alcohol	1.89
Stoddard solvent (a clear, colorless petroleum distil- late of a sweet odor and a flash point not lower than 100°F. It evaporates with- out leaving a stain)	19.50
Xylene	6.00
Potassium hydroxide solu- tion (40°Bé)	1.95
Potassium carbonate (granular)	1.02

Mix the acid with the alcohol, xylene, and Stoddard solvent. Dissolve the potassium carbonate in

the hydroxide solution and add this solution slowly, with constant stirring, to the oleic acid mixture. Continue to stir until saponification is complete.

Rust Remover

	<i>oz</i>
Sulfuric acid	2.17
<i>o</i> -Phosphoric acid	29.44
Oxalic acid	0.38
Water	96.01

Dissolve the oxalic acid in the water, add the phosphoric acid; finally, slowly add the sulfuric acid and shake well. Immerse items in this solution, using only a pottery, china, or glass vessel. Care should be exercised in handling this product.

For Steam Pipes

	<i>lb</i>
Soda ash	36
Sodium hydroxide	30
Sodium metasilicate (anhydrous)	38.4
Tetrasodium pyrophosphate (anhydrous)	12
Sodium dodecylbenzene sulfonate (40% active)	3.6

Have all the ingredients in a finely granulated form and mix thoroughly.

Waterless Hand Cleaners

No. 1

	<i>oz</i>
Glycerin	11.25
Veegum H.V.	3.75

Sucrose monostearate	11.25
Methyl <i>p</i> -hydroxybenzoate	0.30
Water	108.45
Kerosene, deodorized	15.00

Mix the Veegum H.V. with the glycerin. Dissolve the sucrose monostearate and the *p*-hydroxybenzoate in the water, and heat to 80°C. Stir the hot monostearate solution into the mixture of Veegum and glycerin. Continue the stirring until a smooth product is obtained. When the temperature reaches 50°C., stir in the kerosene and homogenize all. Package this soft paste in tubes.

No. 2

	<i>lb</i>
Vanishing cream	25.0
Deodorized kerosene	5.0

Stir the kerosene at a low speed into the vanishing cream, and continue stirring until the mass is uniform.

No. 3

	<i>oz</i>
Kerosene, deodorized	51.00
Lanolin	4.00
Sorbitan monopalmitate	3.20
Polyoxyethylene sorbitan monopalmitate	9.60
Water	60.20
Methyl <i>p</i> -hydroxybenzoate (preservative)	0.26

Mix the kerosene and lanolin with the two monopalmitates and heat to about 60°C. Dissolve the preservative in the water and heat to about

65°C. Pour the water solution into the kerosene mixture and stir continuously until cold. This lotion is excellent for cleaning grease and heavy dirt off the hands when working in garages, machine shops, etc. It should be wiped on the hands and then wiped off with a paper or cloth towel.

No. 4

	oz
Carbowax Compound 4000	25.00
Oleic acid	7.00
Anhydrous lanolin	3.50
Propylene glycol	25.00
Triethanolamine	4.00
Water	25.00
Sodium bisulfite	0.15
Mild abrasive, powdered	41.00
Terpineol	0.25

Heat the Carbowax, oleic acid, lanolin, and glycol to 45°C. Dissolve the triethanolamine and sodium bisulfite in a separate container and heat to the same temperature. Pour the water solution into the fats and keep on stirring until

cool. Add the terpineol and stir in the abrasive slowly. Continue stirring until the mass is homogeneous and of proper consistency.

No. 5

Methylcellulose 4000 cps.	3.32 lb
Lanolin, anhydrous	1.77 oz
Glycerin	20.30 oz
Methyl <i>p</i> -hydroxybenzoate	0.70 oz
Alcohol, specially denatured	16.90 oz
Perfume oil	1.25 oz
Water	16.38 lb

Dissolve the methylcellulose in the water with heating. Add to this the lanolin, glycerin, and preservative. Finally, stir in the alcohol-perfume mixture, and continue to mix until cold.

Rub this paste on the skin and allow it to dry. Then rub again until dirt and grime roll off the skin, and wipe the hands with a towel. This paste is effective against resistant grime and soil and it leaves the skin clean and soft.

Cosmetics and Perfumes

Part I: Cosmetics

Acetylated Liquid Lanolin

This compound is soluble in alcohol. It is an excellent coupling agent. It has many potential uses in aerosols, emulsions, shampoos, nail polish removers, and powdered cosmetics.

Acid Cream

	<i>oz by weight</i>
Cetyl alcohol	19.20
Spermaceti	6.40
Sodium lauryl sulfate	2.56
Lactic acid, 85%	1.54
Water	91.90
Glycerin	6.40

Melt the cetyl alcohol and spermaceti at 50°C. and then add the lauryl sulfate. Stir until the mixture is uniform. Add 50 parts of the water at the same temperature and stir vigorously. Continue rapid stirring until the mixture becomes a uniform emulsion. Stir slowly until this begins to thicken and then add

a warm mixture of the glycerin, lactic acid, and the remainder of the water. Continue stirring until cold.

Aerosol Antiperspirant

	<i>oz</i>
Specially denatured alcohol #40, 95%	1.70
Aluminum sulfocarbolate	1.13
Perfume oil	0.05
Propellent mixture *	2.86
* Propellent mixture: Freon 12, 5 parts; Freon 114, 20 parts.	

Aerosol Cologne

	<i>oz</i>
Specially denatured alcohol 95%	1.80
Perfume oil	0.03
Propellent mixture *	4.20
* Propellent mixture: Freon 12, 5 parts; Freon 114, 20 parts.	

Aerosol Hair Lacquer

No. 1	<i>oz</i>
Specially denatured alcohol #40 anhydrous	2.260

Polyvinylpyrrolidone/ vinyl acetate (60:40%)	0.300
Ethoxylan	0.0063
Myristic alcohol	0.0063
Isopropyl myristate	0.0063
Perfume oil	0.0250
Propellent mixture *	10.16

* Propellent Mixture: Freon 11, 14 parts; Freon 12, 6 parts.

Dissolve the various components in the alcohol and shake well. Finally add the propellent mixture.

No. 2

	<i>oz</i>
Ethyl cellulose	3.20
Diethylene glycol oleate	1.92
Absolute alcohol	58.88
Freon 12	64.00

Dissolve the ethyl cellulose and glycol oleate in the alcohol. Finally add the Freon 12.

This preparation will dry on the hair in about 2 minutes, leaving a glossy film with good setting properties. It can be easily removed when required.

Aerosol Shaving Cream

	<i>lb</i>
Stearic acid	12.30
Polyoxyethylene sorbitan monostearate	9.00
Lanolin, anhydrous	0.75
Glycerin	3.00
Triethanolamine	5.55
Water, soft	119.40
Perfume oil	to suit

Melt the first three ingredients. Mix the triethanolamine, glycerin,

and water, and heat to the same temperature. Stir the aqueous solution into the fatty mixture, and continue stirring until it is cold. Stir in the perfume oil at about 40°C. Use 90% by weight of the shaving cream to be pressurized and 10% by weight of the propellent (dichlorodifluoromethane).

Aerosol Suntan Cream

	<i>oz</i>
Stearic acid	2.55
Propylene glycol mono- stearate	5.10
Mineral oil, white	9.00
Filtrosol A (Schimmel)	12.00
Methyl <i>p</i> -hydroxybenzoate	0.15
Triethanolamine	1.20
Distilled water	120.00
Perfume oil	0.60

Mix the first five components and heat to 60°C. Dissolve the triethanolamine in the water, and heat to the same temperature. Pour the melted fats slowly into the aqueous solution with constant stirring. When a smooth mixture is obtained, stir in the perfume oil, and continue stirring at a slow speed until the mass is cold.

To 46 parts of this cream add 4 parts of

Propellent mixture: Freon 12, 17.1 parts; Freon 114, 12.9 parts.

After-Shampoo Rinse

	<i>oz</i>
Triton X-400	16.00
Diglycol laurate	1.28

Water	110.72
-------	--------

Perfume and color	to suit
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Heat 52 oz of water to 150°F., add the Triton X-400 and diglycol laurate slowly, and stir slowly until a smooth uniform emulsion is obtained. Cool to room temperature. Cool the rest of the water to a temperature of about 40°F., and add this slowly to the other mixture. Stir slowly (rapid stirring tends to produce a thin and unstable dispersion) until the finished product is very smooth and homogeneous. Add the perfume oil and color while stirring in the cold water.

After-Shave Lotion

	<i>oz</i>
Aluminum chloride N.F.	1.28
Acetic acid U.S.P.	1.92
Sodium acetate U.S.P.	0.64
Lanolin, soluble	2.56
Glycerin	4.48
Witch hazel N.F.	25.60
Perfume oil	0.32
Alcohol	51.20
Water	40.00

Dissolve the perfume oil, lanolin, in the alcohols. Add the witch hazel and glycerin and shake well. Dissolve the aluminum chloride, acetic acid, and sodium acetate in the water. Stir the water solution into the alcoholic solution and shake well. Allow the mixture to stand at least 24 hours, and filter if necessary, using kieselguhr as a filtering medium.

Alcoholic Hair Dressing

	<i>oz</i>
Odorless castor oil	23.04
Delyl extra (Givaudan)	8.96
Alcohol	96.00
Perfume	to suit

Dissolve the castor oil in the alcohol, add the Delyl extra and the perfume, and shake well. Allow the mixture to stand at least 24 hours.

Allantoin

Allantoin is a derivative of uric acid, known as Glyoxyldiureide—the diureide of glyoxylic acid.

Allantoin is a healing agent which stimulates the formation of healthy tissue. It is stable, non-toxic, non-irritating, and soothing. When applied to ulcers, cuts, wounds, lacerations, etc., allantoin has the power to remove the objectionable necrotic (decayed) tissue, clear the area, and then follow through by causing the growth of healthy new tissue. Strong alkalies, such as sodium or potassium hydroxide, decompose allantoin; therefore, such alkalies must be neutralized before the allantoin is added to the formulation.

Add allantoin in a proportion of 0.05 per cent to 0.5 per cent in the various cosmetic preparations. Such an addition would enhance considerably the healing properties of those preparations.

Allantoin Hand Lotion

	<i>oz by wt</i>
Glyceryl monostearate, self emulsifying (Aldo 28)	4.48
Light mineral oil	0.64
Butyl <i>p</i> -hydroxybenzoate	0.26
Allantoin	0.26
Propylene glycol	2.56
Water	119.80
Perfume and color	q.s.

Heat the monostearate together with the oil and preservative to 75°C. Heat the water-glycol mixture to 75°C and dissolve the allantoin in it. Mix the two solutions while stirring, and continue to stir until the lotion has reached room temperature. Add some menthol and benzocaine to this lotion, and you have an effective sunburn preparation.

Allantoin After-Shave Lotion

	<i>oz</i>
Hexachlorophene	0.32
Allantoin	0.26
Propylene glycol	2.56
Specially denatured alcohol #40	76.80
Water	47.68
Perfume oil	0.38
Color, as desired	

Dissolve the hexachlorophene and perfume oil in the alcohol; color if desired. Mix the water with the glycol and dissolve the allantoin in it.

Add the water solution slowly to the alcohol solution, and shake well. Allow the liquid to stand for at least a week, then filter.

Allantoin Night Cream

	<i>oz</i>
Triple-pressed stearic acid	12.80
White beeswax	12.80
Spermaceti	10.24
Sesame oil	71.68
Light mineral oil	79.36
Anhydrous lanolin	9.00
Butyl <i>p</i> -hydroxybenzoate	0.52
White oleic acid	2.56
Water	51.20
Allantoin	0.52
Triethanolamine	3.84
Perfume oil	1.02

Melt the first eight ingredients at 70–75°C. Dissolve the allantoin in a small portion of the water and heat it to 70°C.; then pour it into the molten fats. Add the triethanolamine to the rest of the water, and heat to 70–75°C. Mix the two phases, with rapid stirring. Allow the emulsion to cool. Add the perfume oil at 35°C., and continue stirring until it is cold.

Allantoin Lipstick

	<i>oz</i>
White beeswax	16.64
White ozokerite	2.56
Spermaceti	2.56
Carnauba Wax #1	3.84
Anhydrous lanolin	6.40

Castor oil (odorless, tasteless)	71.68
Light mineral oil	5.12
Butyl stearate	2.56
Bromo acid	2.56
Lake colors and white pigment	12.80
Allantoin, 200 mesh	0.07
Perfume oil	1.21

Melt the waxes, lanolin, and one half of the castor oil. Wet the bromo acid with the butyl stearate, then grind in the mineral oil and the rest of the castor oil, slowly adding the pigments and the allantoin. Add this ground pulp to the melted waxes and mix thoroughly. Finally add the perfume oil, and pour into suitable molds.

All-Purpose Cream

	oz
Acetylated lanolin alcohols (liquid fraction)	15.00
Diethyleneglycol mono- stearate C	3.00
Acetylated lanolin	3.00
Stearic acid	3.00
Cetyl alcohol	0.75
Triethanolamine	1.50
Water	123.75
Methyl <i>p</i> -hydroxybenzoate	0.30
Perfume oil	to suit

Place the fatty substances and the methyl *p*-hydroxybenzoate preservative in the mixing kettle and heat to 82°C., stirring constantly until all is completely melted. Place the triethanolamine and the water in a

separate container and heat to 85°C. Pour the water solution into the molten fats, stirring at a medium rate. Add the perfume oil when the temperature drops to about 50°C., and continue to mix slowly until cool. Remix the following day. This cream is emollient and has a glossy appearance. It imparts a non-greasy film to the skin which may be washed off or left on.

Alum Sticks

Aluminum potassium sulfate, U.S.P.	7	lb
Glycerin	1.125	oz
Menthol	1.125	oz
Water	7	lb

Dissolve the first three ingredients in the water by means of a slow heat. Have the molds oiled with mineral oil, stir and pour the mixture into the molds and allow them to cool. Polish the finished stick with water.

Aluminum Methionate Astringent

Use aluminum methionate to improve antiperspirants. It is more effective for this purpose than other common astringent agents tested. It is harmless to fabrics, and it has the additional advantage of being very soluble, hygroscopic, and non-toxic. Because it is hygroscopic it will prevent creams containing it from drying out.

Anti-Dandruff Rinse

	oz
Water	108.00
Glycerin	4.00
1 { Alkyldimethyl benzyl ammonium chloride	0.13
1 { Lauryl isoquinolinium bromide	0.13
Color	to suit
2 { Alcohol	16.00
2 { Perfume oil	to suit

Mix ingredients of (1) thoroughly until solution is complete. Dissolve the perfume oil in the alcohol (2), and pour this solution slowly into (1) with constant stirring. Allow to stand for 24 hours. Filter if necessary.

Antiperspirant Cream

	oz by wt
Stearic acid	21.0
Beeswax, white	3.0
Polyoxyethylene stearate (Myrj 52)	7.5
1 { Polyoxyethylene oxypropylene stearate (G2162)	7.5
Mineral oil, white (65/75 viscosity)	1.5
2 { Water	76.5
2 { Methyl <i>p</i> -hydroxybenzoate	0.3
3 { * Chlorhydrol	33.0
Perfume oil	q.s.

* Chlorhydrol (sodium aluminum chlorhydroxy lactate complex) is an excellent astringent, which makes it effective as an anti-perspirant and deodorant.

Heat ingredients of (1) to 70°C. Heat (2) to the same temperature and stir it into (1). Cool, while stirring, to 40°C., then add (3), and continue to stir until it is dissolved. Finally, stir in the perfume oil and pack.

Antiperspirant Powder

Talcum powder	11 lb
Cornstarch, powdered	1.40 lb
Aluminum sodium sulfate, powdered	4.50 lb
Salicylic acid, powdered	11.25 oz
Boric acid, powdered	11.25 oz

Blend the powders thoroughly, and put the mixture through silk of at least 120 mesh. Use a modern mixing and sifting apparatus for this operation.

Antiperspirant Sticks (Cologne-Type)

	oz
Chlorhydrol,* 40% solution	35.28
Specially denatured alcohol	28.00
Glycerin	2.12
Sodium stearate	4.24
Perfume oil	to suit

* See note under Antiperspirant Cream.

Heat the chlorhydrol solution to 60–65°C. Stir in slowly the alcohol and glycerin and maintain the same temperature. Add the sodium stearate and continue stirring until the resultant soap dissolves. Finally stir in the perfume oil and, after

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