

# PHARMACEUTICAL FORMULAS

PROPOSED FOR "UNOFFICIAL FORMULAS, A. PH. A."

The formulas heretofore published will be found in Volume I, JOURNAL A. PH. A., pp. 169, 366, 505, 637, 760 and 1307; Volume V, pp. 309, 422, 529, 631, 748, 862, 991 (see also p. 1129), 1126, 1265 and 1397; Volume VI, pp. 79, 194, 298, 393, 486, 563, 643, 729 and 823.

For list of committee members and committees see April issue, p. 292. Suggestions for formulas, and comments on those published, are invited. They may be sent to a member of the committee or to Chairman J. Leon Lascoff, 1223 Lexington Ave., New York, N. Y.

698.

## ISOTONIC SOLUTIONS.

Contributed by E. C. Austin.

Isotonic Solutions\* may be roughly calculated as follows:

Mammalian tissues contain 0.91 percent of sodium chloride. By dividing this figure into the molecular weight (58.46) it is found that an isotonic solution of sodium chloride is one that is approximately one-sixth the strength of its molar solution. Thus a liter of a solution of sodium chloride, containing 58.46 Gm. of NaCl, may be made isotonic with the tissues by diluting it to six liters with distilled water.

Since the osmotic pressure of dilute solutions is proportional to the concentration of the dissolved particles it follows that all molar solutions in this same dilution are isotonic with the tissues.

An isotonic solution of procaine would contain 45.5 Gm. of procaine in each liter, while that of pilocarpine hydrochloride would contain 41 Gm. per liter.

Solutions, provided they are not hypertonic, may be made isotonic by adding sodium chloride. A solution of cocaine hydrochloride, to be isotonic, must contain about 6 percent of the salt (57 Gm. per liter). A 1 percent solution is only one-sixth the necessary strength and requires the addition of 7.5 Gm. NaCl ( $9.1 \div 5/6$ ) per liter.

The anesthesia following the use of the local anesthetics is somewhat intensified if no salt is added due to the greater destruction of the cells, but such action is not desirable. As a matter of fact the cells are badly injured even when conditions are made as favorable as possible.

Solutions need not be made exactly isotonic. However, they should be hypertonic rather than hypotonic for the reason that a cell which has been injured, as happens when it has been brought into contact with a protoplasmic poison such as cocaine, atropine, etc., has a higher osmotic pressure than normally.

Although the foregoing rule for making solutions isotonic, and thereby lessening local disturbance, is based upon the laws of osmosis and is just as applicable to-day as it ever was, it should be mentioned that many physiologists now hold that there is no body cell for which these laws are valid inasmuch as they are not surrounded by semi-permeable membranes, as formerly thought, but by surface-tension films which are chemically identical with the rest of the cell protoplasm; that instead of the amount of water absorbed being dependent upon the pressure exerted from within the cell, it is dependent upon the absorbing value of the various soap-like compounds that are formed by the combination of the protoplasm with the different injected substances. (See Fischer in "Forchheimer's Therapeutics of Internal Diseases.")

699.

## SATURATED SOLUTIONS.

By J. LEON LASCOFF.

A saturated solution is one which contains all of a certain substance that the solvent will hold in solution, at a given temperature. The United States Pharmacopoeia gives the exact or approximate solubility of every salt. The temperature for making saturated solutions of salts is 25° C. (77° F.). The chief reasons for delinquencies in making saturated solutions are the following:

1. Impurity of the salts, especially in case of iodides.
2. Careless methods in preparing the solutions.

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\*See also JOURNAL A. PH. A., 8, 79, 1919.

3. Incorrect weights and measures.
4. Working at a temperature above or below the official.
5. The use of containers of wrong sizes.

The proper method for making saturated solutions is to weigh both the salt and the water. The more convenient way is to weigh out the amount of the salt required and for a given volume dissolve this in sufficient water to produce that volume. These amounts must be determined by actual experience and experimentation and the results of the author's work are presented.

The ordinary method of dissolving a substance is to reduce the substance to be dissolved to a powder in a mortar, add the water gradually and triturate until the substance is dissolved, and filter the solution or pass it through a pledget of cotton. The following table will prove convenient; the amount given in grammes of the salt, added to sufficient water to make 100 Cc., will produce a saturated solution at 25° C. (77° F.) or, the amount in grammes, of the other column added to sufficient water to make a fluidounce will produce a saturated solution. The statement is clear, the water and salt together produce the volume of saturated solution.

SATURATED SOLUTIONS.

	Grammes.	Sufficient water to make:—	Grains.	Sufficient water to make:—
Potassium Iodide	99.60	100 Cc.	456.00	1 fluidounce
Sodium Iodide	127.50	100 Cc.	584.30	1 fluidounce
Strontium Iodide	114.90	100 Cc.	526.00	1 fluidounce
Potassium Bromide	50.40	100 Cc.	230.00	1 fluidounce
Sodium Bromide	72.09	100 Cc.	329.00	1 fluidounce
Potassium Chlorate	5.69	100 Cc.	26.00	1 fluidounce
Magnesium Sulphate	56.32	100 Cc.	260.00	1 fluidounce

FORMULAS.

No. 700.

FACE POWDER.

Talcum.....	560.00	Gm.
China Clay, dried.....	200.00	Gm.
Zinc Oxide.....	100.00	Gm.
Zinc Stearate.....	100.00	Gm.
Magnesium Carbonate.....	40.00	Gm.
Perfume to suit,		
To make.....	1000.00	Gm.

No. 701.

COMPOUND TALCUM POWDER.

Talcum.....	885.00	Gm.
Boric Acid.....	40.00	Gm.
Zinc Stearate.....	15.00	Gm.
Magnesium Carbonate.....	60.00	Gm.
To make.....	1000.00	Gm.

For "Talcum Powders" see also Vol. V, p. 862.

No. 702.

DUSTING POWDER.

Menthol.....	5.00	Gm.
Thymol.....	5.00	Gm.
Boric Acid, powdered.....	200.00	Gm.
Perfume to suit		
Talcum		

To make..... 1000.00 Gm.

Pass through a No. 80 sieve.

For "Dusting Powders" see also Vol. V, p. 863.

No. 703.

DUSTING AND HEALING POWDER.

Zinc Oxide.....	356.00	Gm.
Alum, powdered.....	88.80	Gm.
Boric Acid, powdered.....	444.40	Gm.
Mild Mercurous Chloride.....	88.80	Gm.
Liquefied Phenol.....	22.00	Gm.
To make.....	1000.00	Gm.

No. 704.

ANTISEPTIC FOOT POWDER.

Boric Acid.....	75 parts
Zinc Oxide.....	5 parts
Sterilized Talc.....	20 parts
Oil of Eucalyptus or Oil of Thyme in desired quantity may be added.	
Observe caution in heating, do not bring near fire.	

No. 705.

FOOT OINTMENT.

Lead Plaster.....	120 Gm.
Peanut Oil.....	20 Gm.
Petrolatum.....	90 Gm.
Boric Acid.....	15 Gm.
Tannic Acid.....	5 Gm.
Oil of Melissa q. s.	

No. 706.

MANGÉ REMEDY.

Whale Oil.....	500.0 Cc.
Oil of Tar.....	60.0 Cc.
Crude Petroleum.....	30.0 Cc.
Precipitated Sulphur.....	30.0 Gm.

## NATIONAL FORMULARY ADDITIONS AND DELETIONS.

Chairman Wilbur L. Scoville of the National Formulary Committee, under date of August 10th, has mailed out lists of articles which will be dropped from the National Formulary, and of some which will be added. The latter does not include all that will be added, but contains all upon which action has been taken up to the present time. He also sends a list of articles whose deletion has been recommended. Concerning these the committee seeks information. It would like to know whether readers regard any of these of sufficient importance to be retained in the Formulary.

The following articles have been dropped from the National Formulary:—

Acetum Opii, Collodium Iodi, Collodium Iodoformi, Collodium Tiglii, Cordiale Rubi Fructus.

Decoctum Sarsaparillae Compositum.

Elixir Calcii Bromidi, Elixir Calcii Hypophosphitis, Elixir Cinchonae Alkaloidorum et Hypophosphitum, Elixir Cinchonae Alkaloidorum, Ferri et Calcii Lactophosphatis, Elixir Cinchonae Alkaloidorum Ferri et Pepsini, Elixir Ferri Hypophosphitis, Elixir Ferri Lactatis, Elixir Formatum, Elixir Formatum Compositum, Elixir Humuli, Elixir Hypophosphitum, Elixir Hypophosphitum et Ferri, Elixir Lithii Citratis, Elixir Lithii Salicylatis, Elixir Pepsini et Ferri, Elixir Rubi Compositum, Elixir Sodii Hypophosphitum, Elixir Strychninae Valeratis, Elixir Zinci Valeratis.

Emulum Olei Morrhuae cum Calcii Lactophosphatis, Emulum Olei Morrhuae cum Calcii Phosphatis, Emulum Olei Morrhuae cum Pruno Virginiana.

Fluidextractum Conii, Fluidextractum Helianthemi, Fluidextractum Paracoto, Fluidextractum Petroselini Radicis, Fluidextractum Verbenae.

Galatinum Chondri, Glyceritum Guaiaci.

Iodoformum Aromatisatum.

Linimentum Ammonii Iodidi, Linimentum Tiglii, Linimentum Tiglii Compositum.

Liquor Alumini Acetico-Tartratis, Liquor Bromi, Liquor Ferri Hypophosphitis, Liquor Ferri Nitratis, Liquor Ferri Oxysulphatis, Liquor Ferri Protochloridi, Liquor Magnesium Sulphatis Effervescens, Liquor Strychninae Acetatis, Liquor Sodii Citro-Tartratis Effervescens, Liquor Zinci et Alumini Compositus, Liquor Zinci et Ferri Compositus.

Magma Ferri Hydroxidi, Mistura Guaiaci, Mistura Olei Picis, Mistura Opii et Sassafras.

Oleatum Aconitinae, Oleatum Cocainae.

Petroxolinum Creosoti, Petroxolinum Iodoformi, Petroxolinum Picis, Petroxolinum Terebinthinae Laricis, Pilulae Antidyspepticae, Pilulae Antimonii Compositae, Pilulae Colo-

cynthidis Compositae, Pilulae Colocynthidis et Hyoscyami, Pilulae Colocynthidis et Podophylli, Pilulae Glycerylis Nitratis, Potassa cum Calce, Pulvis Gambir Compositus, Pulvis Kino et Opii Compositus.

Sal Potassii Bromidi Effervescens, Sal Vichyanum Factitium Effervescens cum Lithio, Soda cum Calce, Sodii Boro-Benzoes, Succus Citri et Pepsini, Syrupus Calcii Hydrochlorophosphatis, Syrupus Cimicifugae Compositus, Syrupus Codeinae, Syrupus Ferri et Mangani Iodidi, Syrupus Ferri Hypophosphitis, Syrupus Ferri Lactophosphatis, Syrupus Ferri Protochloridi, Syrupus Morphinae et Acaciae, Syrupus Sodii Hypophosphitis.

Tinctura Caramellis, Tinctura Ergotae Ammoniata, Tinctura Kino et Opii Composita, Tinctura Paracoto, Tinctura Zedoariae Amara, Trochisci Gambir, Trochisci Menthae Piperitae.

Vinum Aurantii Compositum, Vinum Carnis, Vinum Colchici Seminis, Vinum Ferri, Vinum Ferri Amarum, Vinum Fraxini, Vinum Pepsini, Vinum Picis, Vinum Pruni Virginiana, Vinum Pruni Virginiana Ferratum, Vinum Rhei Compositum.

The wines of antimony, colchicum corm and ipecac are to be replaced by corresponding tinctures, and authority given to dispense these when ordered under the name of wines. Wine of beef and iron will be made into an elixir. Thus the class of wines will be dropped but the important members of it will be replaced in other preparations.

Troches of charcoal, phenolphthalein, quinine tannate, santonin, santonin compound, and sulphur and cream of tartar will be replaced by the corresponding tablets.

The following articles are dropped from Part II, being no longer needed for formulas in Part I:

Absinthium, Antimonium Sulphuratum, Cacao Praeparata, Cascarilla, Fraxinus, Guaiaci Lignum, Gutta Percha (tentative), Helianthemum, Macis, Mangani Sulphas, Menyanthes, Papaver Fructus (tentative), Paracoto,

Petroselinum Radix, Pimpinella (tentative), Rubi Fructus (tentative), Strontii Carbonas, Strychninae Valeras, Succus Citri, Terebinthina Laricis, Verbena, Vinum Xericum.

The following items are under consideration for deletion and information regarding amount of use of these is desired from pharmacists:

Elixir Ferri Phosphatis, Elixir Ferri Pyrophosphatis, Elixir Lithii Bromidi, Elixir Potassii Acetatis, Elixir Potassii Acetatis et Juniperi, Elixir Quininae Valeratis et Strychninae, Extractum Cinchonae, Extractum Jalapae, Extractum Podophylli, Extractum Quassiae.

Fluidextractum Cinchonae Aquosum, Fluidextractum Convallariae Florum.

Infusum Cinchonae, Infusum Pruni Virginiana.

Liquor Ammonii Citratis, Liquor Arsenicalis Clemens, Liquor Ferri Acetatis, Liquor Ferri Oxochloridi, Liquor Guttae Perchae, Liquor Hydrargyri et Potassii Iodidi, Liquor Hydrargyri Nitratris, Liquor Hypophosphitum, Liquor Picis Alkalinus, Liquor Potassae Chlorinatae.

Mistura Adstringens, Mistura Ammonii Chloridi, Mistura Camphorae Acida, Mistura Camphorae Aromatica, Mistura Ferri Composita.

Oleoresina Lupulini.

Pilulae ad Prandium, Pilulae Aloes Hydrargyri et Scammonii Compositae, Pilulae Laxativae Post Partum.

Syrupus Papaveris, Syrupus Rubi Fructus, Syrupus Sanguinariae, Syrupus Sennae Compositus.

It will be noted that these additions do not include any articles dropped from the United States Pharmacopoeia IX, which will be considered later.

Suggestions for further additions will be welcomed. It is necessary to decide on this list at an early date, and promptness is urged. The address of Chairman Scoville is P. O. Box 488, Detroit, Mich.

#### CHAULMOOGRA TREE TO BE GROWN IN THIS COUNTRY.

Prof. J. F. Rock, former president of the University of Hawaii and now an agent for the Department of Agriculture, has just returned from an extensive trip through the jungles of Siam, Burma and Assam where he has been studying the problem of foreign seed and plant introduction into the United States. After his arrival he announced that the introduction into this country of the chaulmoogra tree was assured and that a permanent supply of the oil for the treatment of leprosy is certain. One hundred acres of ground have been reserved by the Hawaiian Government for the cultivation of the trees. Prof. Rock also brought back

Tinctura Pimpinellae.

Vinum Colchici Seminis, Vinum Ferri Amarum.

The following additions have been voted:

Ampuls—a chapter on, with typical formulas.

Collodion of Ichthyol.

Elixir Antiasthmatic, Hare (with appropriate title), Elixir of Beef and Iron (replacing Wine of Beef and Iron), Elixir of Buchu, Juniper and Potassium Acetate, Elixir of Catnep and Fennel, Elixir of Creosote and Terpin Hydrate, Elixir Digestive Compound, Elixir of Five Bromides, Elixir of Guarana and Celery, Elixir of Guarana Compound, Elixir of Hydrastis Compound, Elixir of Hydrangea and Lithia, Elixir of Manaca with Salicylates, Elixir of Saw Palmetto and Sandal Compound, Elixir of Tonga Compound.

Liniment of Calamine, Lotion of Calamine, Lotion of Calamine Compound.

Ointment of Capsicum Compound, Ointment of Ichthyol, Ointment of Mustard Compound.

Petroxolin Ichthyol.

Syrup of Chocolate, Syrup of Thyme Compound.

Tablets—chapter on, and typical formulas.

Troches of Red Gum.

The following elixirs are also under consideration but definite action has not been taken:

Elixir Aletris Compound, Elixir Dioscorea Compound, Elixir Four Chlorides, Elixir Ginseng Compound, Elixir Helonias Compound.

with him several specimens of the "taraktogenos" plant, the seeds of which have been sent to the various experimental stations of the Department of Florida, Maryland and California for germination. Within eight years enough fruit will be borne from these trees to initiate a domestic source of supply of chaulmoogra oil. He declared that the natives of the parts of Asia which he visited had been using the curative properties of the taraktogenos trees for centuries. (See article July JOURNAL A. PH. A., and also in *Weekly News Letter*, U. S. Department of Agriculture, August 3, 1921.)