PHARMACEUTICAL MILKS

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Pharmaceutical Milks.

The name "milk" is one that has been and is still applied to at least three kinds of pharmaceutical preparations. In all cases the name has been given because at some stage of the preparation the substance has had the appearance of milk. The three types of products called milks are:

I Emulsions, suspensions of fatty or resinous matter in water.

II Magmas, suspensions of solid particles in water.

III Precipitated Substances, fine powders prepared by precipitation, which when being precipitated produce a milky appearance.

EMULSIONS. The names mixtures, emulsions and milks have all been given to a class of suspensions of oily or resinous matter in water giving the preparation a milky appearance. Perhaps the oldest of this type is Virgin's milk, the Lac Virgineum[1] or Lac Virginale[2] of the old pharmacopoeias. This was a preparation for whitening the hands and face, sometimes for covering up pimples, redness, etc. In its more innocent form it consisted of a mixture of tincture of Storax or Benzoin with rose water or other aromatic water. In some instances however, it contained precipitated lead salts, lead sulphate for example, prepared by mixing equal volumes of a solution of litharge in distilled vinegar and alum in water. The Virgin's milk of present day formularies is a mixture of equal volumes of tincture of benzoin and rose water. This or a similar preparation is sometimes called Milk of Rose Lotion.

Other milks of this type are milk of almond, milk of asafoetida, milk of ammoniac, milk of turpentine, milk of scammony and milk of guaiac.

Milk of Almonds was made in ancient times by simply mixing crushed sweet almond seeds with water and shaking thoroughly. The milk of almonds, of today is prepared by adding sugar and acacia to the blanched almonds, beating this mixture in a mortar until it is thoroughly mixed, and then adding the required amount of water. Finally the mixture is agitated until it becomes uniform. The acacia is added to make a better emulsion.

1. Moyse Charas-Pharmacopee Royale, Paris 1676.
   Moyse Charas- " " " 1692.
2. De Meuve, Dictionaire Pharmaceutic, Paris 1689.
   Trommsdorff- Die Apotheker-Kunst Vol.2, p. 607.

Milk of Asafoetida is a mixture of selected tears of asafoetida and water. This preparation does not require the addition of adhesive substances such as acacia because it is adhesive in itself.

Milk of Turpentine is a mixture of rectified oil of turpentine, expressed oil of almonds, syrup, acacia and water. This mixture is perfectly white, and is administered to patients when turpentine is prescribed. The above three preparations are official in the last Pharmacopoeia of the United States.

Milk of Ammoniac is prepared by rubbing ammoniac, a gum resin obtained from Dorema Ammoniacum, in a warm mortar with water until a uniform emulsion is formed, straining the mixture, and diluting it with more water to the required amount. Milk of ammoniac has not been official since 1890, and is not used in medical practice to any great extent.

Milk of Scammony, a preparation official in the British Pharmacopoeia of 1885 is a mixture of resin of scammony and milk. This preparation is not official now, nor has it been at any time in the United States Pharmacopoeia.

Milk of Guaiac, another British preparation is a mixture of resin of guaiac, sugar, tragacanth, and cinnamon water.

MAGMAS . The second class of "milks" here considered includes the magmas, sometimes termed mixtures, and certain other suspensions of finely divided solids in water. They are not absolutely permanent preparations, but the condition of suspension is readily reestablished by agitation. The milks of this class include milk of lime, milk of bismuth, milk of magnesia, and milk of iron.

Milk of Lime is a smooth mixture or thin magma composed of slaked lime mixed with three or four times its weight of water.

Milk of Bismuth, a thick white liquid of neutral reaction is made by adding an acidulated solution of bismuth subnitrate, rapidly and with constant stirring, to a mixed solution of ammonium carbonate and ammonia water. A chemical reaction takes place which results in the formation of bismuth hydroxide and a small quantity of bismuth subcarbonate which reamin suspended in the aqueous solution. The ammonium nitrate and the excess of alkali are removed by repeated washing by decantation.

Milk of Magnesia is a thick white liquid containing about 7 per cent of magnesium hydroxide in suspension in water. It is prepared by adding a solution of sodium hydroxide to an aqueous suspension of magnesium carbonate with constant stirring, and then agitating the mixture frequently during fifteen minutes. Magnesium hydroxide is precipitated during the reaction in the form of a magma, and is then washed several times until the washings cease to react with phenolphthalein test solution.

Milk of Iron[3] has nothing in common with milk. In past days it was composed of a very fine suspension of ferric phosphate to which a specified quantity of iron chloride and sodium phosphate solution was added with constant stirring. The precipitate was washed, and diluted until the product weighed 1000 grams. This product contained about 1 per cent of hydrated ferric phosphate. In our day, milk of iron, a National Formulary preparation, is prepared by treating a very dilute solution of ferric sulphate with a diluted solution of ammonia water. As a result of chemical reaction ferric hydroxide is precipitated and after the precipitate has settled the clear liquid is decanted, and fresh water added until the decanted liquid gives only a faint cloudiness with barium chloride test solution. Then water is added to the magma until it reaches the required weight.

3. Real Enzyklopadie Des Gesamten Pharmazie, Vol 4, p. 568.

PRECIPITATED SUBSTANCES The third type of "milks" includes ony only two preparations commonly known as "milks". These are Precipitated Sulphur and Lac Terrae.[4]

Precipitated Sulphur of the U.S.P. also known as Lac Sulphuris, Lac Magisterium sulphuris, though a finely dividedd powder, and not a liquid preparation was undoubtedly designated a milk because of the milky appearance produced by the precipitation of the sulphur during the process of preparation. After the precipitated solid has been removed and dried it was misleading to call it a "milk", The public generally considered it to be a iiquid when in reality it was a solid. Milk of sulphur was known to the ancients, and it was called by that name for a long time. This name is now but little used, the prepara tion being known as Sulphur Precipitatum or precipitated sulphur.

Lac Terrae[4]or oxide of magnesia, also known as white magnesia and magensia alba, belongs to this class of preparations.

4. Brestowski, A. Handwoerterbuch der Pharmacie, Vol.2, p. 2.

Milks of the United States Pharmacopoeia.

	1820	1830	1830	1840	1850	1860	1870	1880	1890	1900	1910
Milk of Almonds	x	x	x	x	x	x	x	x	x	x	x
Milk of Ammoniac	x	x	x	x	x	x	x	x	x		
Milk of Asafoetida		x	x	x	x	x	x	x	x	x	x
Milk of Bismuth											x
Milk of Magnesia											x
Milk of Sulphur			x	x	x	x	x	x	x	x	x

Milk of Bismuth.

Raubenheimer, O. 1908.

Bismuthi Hydorxidum.

Proc.A. Ph. A., 56, 1010.

The author discusses the formula for the preparation of bismuth hydroxide given in the National Formulary and offers a new improved formula and title.

Raubenheimer, O. 1909.

Magma Bismuthi.

Proc. A. Ph. A., 57, 1024;(Proc. A.Ph.A., 58, 128).

A detailed description of the conditions necessary to produce an acceptable preparation together with a formula.

Vanino, L. and Zumbush, E. 1910.

Magma of Bismuth.

Arch. Pharm. 665; (Dig. of Com. on U.S.P., 1910, 526).

The authors review the chemistry of hydrated oxide of bismuth and recommend the use of mannite to insure the absence of nitrate.

Beringer, M. 1910.

Magma of Bismuth.

Am. J. Ph., 250; (Dig. of Com. on U.S.P. 1910, 526).

The author makes hydrated oxide of bismuth by an inverted percolation process which he says is in reality a process of dialysis.

Raubenheimer, O. 1910.

Magma Bismuthi.

Proc. A. P. A., 57, 1030; (Y. B. of B. Ph. Conf., 1910, 264).

The author gives a formula and method of preparation.

Lippincott, D. 1911.

Magma of Bismuth.

Rocky Mt. Durggist 25, 14;(Dig. of Com. on U.S.P., 1911, 428).

The author presents a formula for milk of bismuth in which he uses bismuth subnitrate, glycerin, and distilled water.

Miller, S. 1914.

Magma Bismuthi.

Am. J. Ph. 86, 11; (Dig. of Com. on U.S.P. 1914, 340).

A modified formula with directions for making magma of bismuth.

1914.

Magma Bismuthi.

Jour. A.Ph.A., 2, 1571.

A formula and method of preparation.

Mueller, B.S. 1914.

Magma Bismuth.

Am. J. Ph. 1914, 86, 11;(Y.B. of B. Ph. Conf. 1914, 243).

The author gives a formula and method of preparation.

1915.

Magma Bismuthi.

Y.B. of B. Ph. Conf., 1915, 333.

A formula and method for the preparation of magma bismuth.

Milk of Lime.

1890.

Milk of Lime.

Am. Jr. Ph., 62, 337; (Proc. A. Ph. A., 39. 507).

Milk of lime will destroy the bacillus of charbon but not its spores. The bacillus of tetanus and tuberculosis are not affected by lime.

Milk of Magnesia.

Dieterich, E. 1885.

Milk of Magnesia-Stable Preparation.

Ph. Centralh., 26, (A. Drug., 15, 57; Proc.A.Ph.A., 34, 510).

A stable mixture is obtained by triturating 10 parts of calcinated Magnesia with 100 parts of distilled water, and adding 40 parts of glycerin.

Fleury, M. 1891.

Magnesium Hyddate Preparation.

Rep. de Pharm., 3, (Am. Jr. Ph., 63, 2883)(Proc.A.Ph.A,39,507).

The author advises pharmacists to prepare their own hydrated magnesia and gives a method of preparation.

Report Nat. Form. Committee. 1904.

Magma Magnesia.

Proc. A. Ph. A., 51, 399; (Y.P. of B. Ph. Conf., 1904, 291).

A formula and method of preparation.

Caldwell, P. 1906.

Magma Magnesiae N.F.

Drug. Cir. and Chem. Gaz.50, 393;(Dig. of Com. on U.S.P.,1906, 354).

The author recommends heating and pouring the magnesium sulphate solution into the solution of sodium hydroxide on preparing magnesia magma. He also recommends heating or churning the resulting magma so as to have it "stand up" better.

Raubenheimer, O. 1907.

Magma Magnesia.

Proc. A.Ph.A., 55, 150.

The author relates his experience in preparing magma magnesia, discusses several methods of preparation and gives his own special formula which he thinks is more successful.

Boehm, J. 1908.

Magma Magnesiae.

Bull. A.Ph.A.,88,154;(Dig. of Com. on U.S.P. 1908, 340).

The author presents a formula for magma magnesia with detailed directions for preparing. The formula and process yields a heavier precipitate than that obtained from the N.F. formula.

Cliffe, W. L. 1910.

Magma Magnesiae N.F.

Am. J.Ph.,82,250;(Dig. of Com. on U.S.P., 1910, 527).

The author points out that milk of magnesia made with ordinary clear water shortly acquires a yellowish tint, and thinks that this preparation must necessarily be washed with distilled water.

Needham, R.H. 1910.

Magma Magnesiae N.F.

Proc. Texas Ph.A.1910,71;(Dig. of Com. on U.S.P. 1910, 527).

The author suggests using hot water for washing magma magnesiae. This, he thinks, would eliminate the contamination of organic matter.

Kaiser, W. F. 1910.

Magma Magnesiae N.F.

Proc. Wis. Ph.A., 1910,63;(Dig. of Com. on U.S.P., 1910,527).

The author outlines a method for making milk of magnesia on short notice.

Hilton, S. L. 1911.

Magma Magnesiae N.F.

Bull. A.Ph.A., 6, 132, 248;(A.Jr.Ph.,83,268; Dig. of Com. on U.S.P., 1911, 429).

The author presents a formula and an assay process for magma magnesiae.

Hilton, S. L. 1911.

Magma Magnesiae, N.F.

Am. Druggist, 58, 349; (Dig. of Com. on U.S.P., 1911,429).

The author calls renewed attention to the desirability of including an assay method for magma magnesiae.

1911.

Magma Magnesiae N.F.

Pharm. Jour. 86,546;(Dig. of Com. on U.S.P., 1911, 429).

The editor critizes the use of gelatin in the preparation of magma magnesiae because in an alkaline medium gelatin behaves as an ideal nidus for bacterial growth. Furthermore there is a great variability in different samples of gelatin in gelatinizing power and commercial gelatin is notorious as a carrier for impurities.

Lippincott, D. 1911.

Magma Magnesiae N.F.

Rocky Mt. Durggist, 25,14;(Dig. of Com. on U.S.P., 1911, 429).

The author presents a formula for milk of magnesia in which he uses calcined magnesia, simple syrup, glycerin and lime water.

Hilton, S. L. 1911.

Magma Magnesia- Revised Formula.

Am. Jr. Ph., 83, 268;(Proc. A.Ph.A., 59, 78).

A formula and process for the preparation of magma of magnesia. Also a description of a process for an assay of the preparation.

Beringer, George M. 1913.

Magma Magnesiae N.F.

Proc. N.J.Ph.A., 1913,46;(J.A.Ph.A.,2, 1141; Am. J. Ph.,85.302 ; Dig. of Com. on U.S.P., 1913, 344).

A modified formula for magma magnesia, with directions to boil the magma before washing.

Grosh, D. M. 1913.

Magma Magnesiae N.F.

Drug. Circ., 57, 149;(Dig. of Com. of U.S.P., 1913, 344).

The author claims that the process of making milk of magnesia N.F. may be improved by using a stronger ammonia water instead of sodium hydroxide.

E'we, Geo. E. 1913.

Magma Magnesiae N.F.

Proc. Pa.Ph.A., 1913,89;(J.A.Ph.A., 2, 973; Dig. of Com. on U.S.P., 1913, 344).

The author assayed a sample of milk of magnesia and found it to be 20% stronger than strength declared on the label. This milk was recommended for the preparation of effervescent magnesium citrate solution, and when so used, resulted in a unpalatable preparation due to a lack of acidity.

Beringer, G.M. 1913.

Magma Magnesia, Improved Formula.

Am. J.Ph.,85,302;(Y.B. of B.Ph. Conf., 1914,243).

The author says that the present N.F. and B.P.C. formula commits the manipulative error of directing the sodium hydroxide solution to be poured into the magnesium sulphate, and the use of cold solutions, for hot ones.

The author also gives a formula and gives a new method of preparation.

Hensel, S.T. 1914.

Magma Meagnesia N.F.

J.A.Ph.A.,3, 1118;(Rocky Mt. Druggist, 28,8; Dig. of Com. on U.S.P. 1914, 340).

A discussion of the formula proposed by Beringer.

Hensel, S.T. 1914.

Magnesia Magma-Milk of Magnesia N.F.

Jour. A.Ph.A., 3, 1118.

The author discusses Beringer's process of preparing milk of magnesia according to the formula given in the National Formulary.

McNeery, W.W. 1916.

Milk of Magnesia.

Jour. A.Ph.A., 5, 611;(Y.B.B.Ph. Conf., 1916, 417).

The author gives a formula and method of preparation.

Milk of Sulphur.

Moith, A. T. 1867.

Lac Sulphur.

Proc. A. Ph. A., 15, 385.

A method for testing for the presence of impurities.

Attfield. 1869.

Sulphur Precipitated.

London Ph. Jr., 1869; (Proc. A.Ph.A., 19, 347).

An article on the adulteration of precipitated sulphur in England.

Dietrich, C.W.L. 1876.

Milk of Sulphur.

A.Jr. Ph., 48, 389;(Proc. A.Ph.A., 25, 241).

Samples of commercial precipitated sulphur are adulterated with calcium sulphate. From 23 to 47% of $CaSO_4$ are found in precipitated sulphur.

Siebold, L. 1876.

Sulphur Praecipitatum.

Yearbook of Pharmacy 1876, 607; (Proc. A.Ph.A., 26, 3 44).

A better product of precipitated sulphur is obtained b if a barely sufficent quantity of hydrochloric acid is added to decompose the calcium polysulphide, so that the solution re - mains alkaline. The resulting preparation will be finer than that in which too much hydrochloric acid has been used.

Bernick, A. 1887.

Precipitated Sulphur-Containation with Iron.

Arch. d. Pharm., 225, 310; (Proc. A.Ph.A., 35, 192).

In the author's opinion the presence of iron in precipitated sulphur is due to the use of iron vessels in the process of manufacture.

Moberger, 1898.

Precipitated Sulphur-Apparatus for the Economical Preparation.

Pharm. Ztg., 43, 238;(Proc. A. Ph. A., 46, 910).

The author recommends a new apparatus for the preparation of precipitated sulphur and gives drawing of it and explains his process.

Brownlee, R. H. 1907.

Sulphur Praecipitatum.

J. Am. Chem. Soc., 29, 1032;(Dig. of Com. on U.S.P. 1907,435).

The author has studied precipitated sulphur with the purpose of investigating the relation between the proportion of amorphous sulphur found in a given sample of precipitated sulphur and the conditions under which the precipitation and hardening of the sulphur took place.

Sorley, S. M. 1908.

Sulphur Praecipitatum.

Pharm. Rev., 26, 353;(Dig. of Com. on U.S.P., 1918, p. 528).

The author presents a review of the literature relating to the original history of precipitated sulphur.

Sayre, L. E. 1910.

Sulphur Praecipitatum.

Bull. Kansas, Bd. Health, 1910,53;(Dig. of Com. on U.S.P., 1910, 739.)

The author reports that samples of precipitated sulphur were found to contain from 4 to 50 per cent of calcium sulphate.

Davis, J. C. 1910.

Sulphur Praecipitatum.

Proc. Mich. Ph. A., 1910,64;(Dig. of Com. on U.S.P., 1910,739).

The author reports that lac sulphur requires watching. It often contains large amounts of lime salts, and sometimes powdered talc.

Teenmann, O. 1912.

Sulphur Praecipitatum.

Apoth. Ztg.,27,84;(Pharm. Ztg. 57, 372; Dig. of Com. on U.S.P., 1912, 459).

Precipitated sulphur on keeping for an appreciable length of time will develop an acid reaction which should be provided for in the pharmacopoeial requirements.

Glossary.

Milk of Almonds -Synonym, U.S.P., 1910.

Emulsum Amygdalae, Official Latin Title, U.S.P. 1910.

Emulsion of Almond, Official English Title, U.S.P. 1910.

Mistura Amygdalae, Official Latin Title, U.S.P. 1880.

Almond Mixture, Official English Title, U.S.P. 1880.

Lac Amygdalae, Synonym, American Dispensatory, 1806.

Emulsion D'Amande, Official French Title, 1908.

Lait d'amande, French Synonym. 1908.

Mandelmilk, German Synonym.

Milk of Ammoniac- Synonym, U.S. Dispensatory.

Emulsum Ammoniaci, Official Latin Title, U.S.P. 1890.

Mistura Ammoniaci, Official Latin Title, U.S.P. 1880.

Emulsion of Ammoniac, Official English Title, U.S.P.1890.

Lac Ammoniaci, Synonym U.S. Dispensatory, 1894.

Milk of Asafoetida,-Synonym, U.S.P. 1910.

Emulsum Asafoetidae, Official Latin Title,U.S.P., 1910.

Emulsion of Asafoetida, Official English Title, U.S.P.1910.

Mistura Asafoetidae. Official Latin Title, U.S.P. 1880.

Asafoetida Mixture. Official English Title, U.S.P. 1880.

Lac Asafoetidae, Synonym, U.S. Dispensatory,

Milk of Bismuth,- Synonym, U.S.P. 1910.

Magma Bismuthi, Official Latin Title, U.S.P., 1910.

Bismuth Magma, Official English Title, U.S.P., 1910.

Milk of Guaiac,- Synonym, Pharmacopoea universalis, 1846.

Mistura Guiaci, Official Latin Title, B.P. 1885.

Guaiacum Mixture, Official English Title, B.P. 1914.

Lac Guaiaci, Synonym, London Dispensatory, 1826.

Milk of Iron,- Synonym, American Dispensatory, 1898.

Magma Ferri Hydroxidum, Official Latin Title, N.F.1916.

Ferri Hydroxide Magma, Official English Title, N.F.1916.

Ferric Hydroxide, Synonym, N.F. 1916.

Lac Ferri, Synonym, National Dispensatory, 1894.

Milk of Lime,-Official Title, B.P., 1914.

Calcii Hydras, Official Title, B.P.C., 1907.

Lac Calcis, Synonym, B.P.C., 1907.

Milk of Magnesia,- Synonym, U.S.P., 1910.

Magma Magnesiae, Official Latin Title, U.S.P., 1910.

Magnesia Magma, Official English Title, U.S.P., 1910.

Milk of Roses,- Synonym, B.P.C., 1911.

Lotio Rosae, Official Latin Title, B.P.C., 1911.

Rose Lotion, Official English Title, B.P.C., 1911.

Lac Rosae, Synonym, B.P.C., 1911.

Lac Virginis, Synonym, National Dispensatory, 1894.

Lac Virginale, Synonym, Pharmacopoea Universalis, 1846.

Virgin's Milk, " " " 1846.

Milk of Scammony,- Synonym, National Dispensatory, 1884.

Mistura Scammonii, Official Latin Title, B.P., 1885.

Scammony Mixture, Official English Title, B.P., 1885.

Lac Scammony, Synonym, National Dispensatory, 1884.

Milk of Sulphur,- Synonym, U.S.P., 1910.

Sulphur Praecipitatum Official Latin Title, U.S.P.1910.

Precipitated Sulphur, Official English Title, U.S.P.1910.

Lac Sulphuris, Synonym, National Dispensatory, 1894.

Lac Magisterium Sulphuris, Synonym, Nat. Diepensatory, 1894.

Milk of Turpentine, Synonym,

Emulsum Olei Terebinthinae, Official Latin Title, U.S.P. 1910.

Emulsion of Oil of Turpentine, Official English Title, U.S.P., 1910.

Approved Nellie Antoinette Wakeman

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