A BIBLIOGRAPHY OF THE HISTORY OF SOLUTION OF MAGNESIUM CITRATE

by

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BIBLIOGRAPHY

Massignon,----- 1847

Note sur la preparation de la lemonade an citrate de magnisie.

Journ. d. Pharm. etd Chim. 12, p. 31.

A new formula for the solution originated by Roge and praise of his work.

Mialke, --- 1847

Remargues Chimico-therapeutiques sur lecitrate de magnisie.

Jour. d. Ph. et Ch., 12, p. 27.

A review of the work of Roge Delabare and explanation of the chemistry of this solution.

Roge Delabarre, ----- 1847

Notice sur le citrate de Magnesie et sur une nouvelle eau purgative dont ce sel faint base.

Journ. d. Pharm. et d. Chimie, s.3, V.11, p. 411; (Ph. J., 7, p. 17; A.J.P. 19, p. 218.)

The original reports the preparation of solution of citrate of magnesia, called d'Eau de Sedlitz sans aneertume au Eau miniral purgative au citrate de magnesie.

Procter, W., Jr. 1847

Citrate of Magnesia.

A.J.Ph. 19, p. 264.

A discussion of the various suggested formulas for the preparation of citrate of magnesia.

Renauldin,---& Saubeiran,--- 1847

Citrate de Magnesie.

Journ. de Pharm. S.3, V.11, p. 413. (A.J.P., 19, p. 218.)

Discuss the formula offered by Delabarre for Solution of Magnesium Citrate.

Procter, W. Jr. 1848

(Solution of Citrate of Magnesia.)

A.J.Ph. 20, p. 254.

Discusses a improved formula for the preparation of Solution of magnesium.

Procter, W.Jr. 1850

Solution of Citrate of Magnesia.

A.J.Ph., 22, p. 112.

Discusses an improved formula for the preparation of Solution of Citrate of Magnesia..

Procter, W. Jr. 1851

On Solution of Citrate of Magnesia.

A.J.Ph. 23, p. 214. Dispens. U.S.A., 9 Ed., p. 1073; Ibid, 10 Ed., p. 1072;

A general discussion of the merits of citrate of magnesia and the difficulties in preparing it.

Wood, G.B. & Bache, F. 1851

Liquor Magnesiae Citratis U.S. .

Dispens. U.S.A., 9, p. 1072; Ibid, 10, p. 1071;

"Magnesium Carbonate- 5 drachms, citric acid 7½ drachms, syrup of citric acid, 2 fluidounces, Water, a sufficient quantity. Rub 4 dr. of $MgCo_3$ with syrup and filter; put into bottle and add remainder of $MGCO_3$. This preparation is an extemporaneous solution and is not to be kept."

Parrish, E. & Smith, A. 1852

Report on Soluble Citrate of Magnesia.

A.J.Ph., 24, p. 113 . Dispens. U.S.A., 10 Ed., p. 1073; Ibid., 11 Ed., p. 1134; Ibid., 12 Ed., p. 1208; Ibid, 13 Ed. p. 1260; Ibid, 14 Ed., 1301; Ibid., 15 Ed., p. 882; Ibid, 16 Ed., p. 913; Ibid., 17 Ed., p. 813.

Report on a soluble citrate of magnesia and its preparation.

Robiquet, E. 1852

Remarques sur la préparation des lemonades au citrate de magnesie.

Jour. d. Pharm. et d. Chim. S.3, V.21, p. 292; Dispens. U.S.A., 10 Ed., p. 1073; Ibid., 11 Ed., p. 1134; Ibid, 12 Ed., p. 1208; Ibid., 13 Ed., p. 1260; Ibid, 14 Ed., p. 1301; Ibid., 15 Ed., p. 883; Ibid., 16 Ed., p. 913; Ibid., 17 Ed., p. 813.)

Discusses the preparation of a lemonade of citrate magnesia.

Ellis, C. 1854

On Prepared Citrate of Magnesia.

Am. Jour. Ph. 26, p. 306; Dispens. U.S.A., 11 Ed., p. 1134; Ibid., 12 Ed., p. 1208; Ibid., 13 Ed., p. 1260.

Discusses the preparation of the solid citrate of magnesia and its uses.

Wislin, A'Gray, --- 1854

Limonade au Citrate de Magnesie; Nouvelle Formule.

Jour. d. Chim. Med. S.3, V.10, p. 230.

Discusses a new method of preparation of citrate of magnesia.

Robiquet, E. 1855

Procede Pour Preparer le Citrate de Magnesie Soluble.

Jour. des Conn. Med., ----, p.-----.; Jour. d. Chim. Med., S.4, V.1, p. 336;(A. J. Ph. 27, p. 317; Dispens. U.S.A., 11 Ed., p. 1134; Ibid., 12 Ed., p. 1208; Ibid., 13 Ed., p. 1260; Ibid. 14 Ed., p. 1301; Ibid., 15 Ed., p. 882; Ibid., 16 Ed., p. 913; Ibid., 17 Ed., p. 813;King's Am. Dispens. 6 Ed., p. 1166; Ibid., 8 Ed., p. 1059; Ibid., 10 Ed., p. 1050 Ibid., 15 Ed., p. 1059; Ibid., 16 Ed., p. 1059.)

Discusses a process for preparing a soluble citrate of magnesia.

Parrish, E. 1856

Liquor Magnesin Citratis.

Introduction to Practical Pharmacy 1, p. 357.

A method of preparing solution of Magnesium Citrate with full instructions for beginners.

Stearns, F. 1857

A New Method of Preparing Solution of Citrate of Magnesium.

Proc. Am. Ph. A., 6, p. 752. (A.J.Ph. 30, p. 31;)

A discussion of a changed formula for the preparation of the Solution of Citrate of Magnesia.

(Editor) 1858

Tartro-citrate of Soda.

A.J.Ph. 30, p. 89.

Discusses the use of as a substitute for citrate of Magnesia.

Wood, G.B. & Boche, F. 1858

Liquor Magnesiae Citratis U.S.

Dispens. U.S.A., 11 Ed., p. 1133; Ibid., 12 Ed., p. 1207; Ibid., 13 Ed., p. 1259; Ibid., 15 Ed., p. 881; Ibid., 14 Ed., p. 1299; Ibid., 16 Ed., p. 912; Ibid., 17 Ed., p. 812; Ibid., 18 Ed., p. ---; Ibid., 19 Ed., p. 725;

Replaced carbonate of Magnesia with Magnesia and supplied carbonic acid by adding potassium bicarbonate just before closing bottle. This is due to eliminate the fault of a whitish precipitat from forming impurities in $MgCO_3$.

Jefferson, C.T. 1859

Solution of Magnesium Citrate.

Drug Circ. 33 p. 181;

Discusses a formula for solution of Magnesium Citrate with a slight modification from the U.S.P. formula.

Smith, J.T.

Tartro-Citric Le monade.

A.J.Ph., 32, p. 408.

Discusses the substitution of sodium tartrate for the magnesium citrate in the official preparation.

Watson, W.J. 1861

On the Preparation of Citrate of Magnesia.

A.J.Ph., 33, p. 121;

Gives formula for the preparation of a "so called" better preparation.

Editor 1863

Solution of Magnesium Citrate.

Drugg. Circ., 7, p. 74.

Discusses the troubles encountered in preparing this solution and the answer to these troubles.

(Editor) 1864

Solution of Magnesium Citrate.

Drugg. Circ., 8, p. 167.

Discusses a formula for the preparation of this solution which can be used by druggists in making small quantities.

King, J. 1864

Liquor Magnesiae Citratis.

Am. Dispens. 6 Ed., p. 1165; Ibid., 8 Ed., p. 1059; Ibid., 10 Ed., p. 1059; Ibid., 15 Ed., p. 1059; Ibid., 16 E$_{a}$., p. 1059.

Gives a formula for the preparation of this solution but uses two solutions which are to be mixed for use. Also uses carbon Dioxide gas.

(Editor) 1866

Liquor Magnesiae Citratis.

Drugg. Circ., 10, p. 249.

Discusses some of the problems encountered in preparing solution of Citrate of magnesia and how to avoid these difficulties.

Morelli, --- 1866

Nouvelle Preparation du Citrate de Magnesie Cristallise.

Repertoire de Pharmasie, 22, p. 429; (A.J.P., 38, p. 300.)

A discussion of the preparation of an extemperanous solution for use by the pharmacist.

Allaire, C.B. 1867

On Liquor Magnesiae Citratis.

A.J.Ph., 39, p.196;

Discusses the formula for preparing this liquor and the difficulties encountered.

Buck, J.T. 1867

Note Solution of Citrate of Magnesia.

A.J.Ph., 39, p. 112. (Proc. A.Ph.A., 17, p. 337; Drugg. Circ., 11, p. 83.

Suggests a formula for the preparation of this solution.

Dymond, G. 1867

Notes on Effervescing Citrate of Magnesia.

Ph. J., S.2, V.9, p. 167.

Argues for the use of the official preparation and not substitutes of the several kind that exist.

Maisch, J.M. 1867

On Liquor Magnesiae Citratis.

A.J.Ph., 39, p. 1; Dispens. U.S.A., 13 Ed., p. 1260; Ibid., 14 Ed., p. 1301; Ibid., 15 Ed., p. 882; Ibid., 16 Ed., p. 913; Ibid., 17 Ed., p. 813; Ibid., 18 Ed., p.---; Ibid., 19 Ed., p. 726; Proc. A.Ph.A., 15 p. 164; Drugg Cir., 11, p. 31.

An investigation into the various types of magnesia that can be used and yielding the best solution.

Warner, W.R. 1867

On Epson-Salt in Citrate of Magnesia Solution.

A.J.Ph., 39, p. 397.

Comments on a formula for a solution of Magnesium Citrate containing Epson Salt.

Atkinson, W.D. 1868

On Liquor Magnesiae Citratis.

A.J.Ph., 40, p. 16.

Discusses an improved method of preparation of this liquor.

Rother, R. 1870

Solution of Citrate of Magnesia.

Ph. & Chem. Rcs. 3, p. 1. (A.J.Ph., 42, p. 171; Proc. A.Ph.A., 19, p. 538.)

Discusses the various difficulties encountered when preparing Solution of Citrate of Magnesia.

Markol, G.F.H. 1871

On the Amount of Magnesia & Citric Acid Contained in some commercial Solutions of Citrate of Magnesia.

Proc. A.Ph.A., 19, p. 532. (A.J.Ph., 46, p. 213; Drugg. Circ., 34, p. 159.)

Discusses the Assay of commercial samples of solution of Magnesium Citrate and the discouraging results obtained.

Bond, H.T. 1873

Liquor Magnes. Citratis.

Drugg. Circ., 17, p. 176. (A.J.Ph., 47, p. 38.)

Describes a "trick" method of preparing this liquor, in which the product must be shaken before dispensing to start the reaction.

Bultot,---. 1873

Falsifactions du Citrate ae magnesie et au magistere de bismuth.

Rep. de Pharm., N.S. 1, p. 135. (Proc. A.Ph.A., 21, p. 495.)

A discussion of the adulteration of solution of citrate of magnesium, with tartrate of soda, and magnesium sulfate.

(Editor) 1873

Solution of Citrate of Magnesia.

Drugg. Circ., 17, p. 190.

A formulae for liquer magnesiae citratis which will keep. Solutions are made up separately and mixed when used.

(Editor) k873

The Adulteration Act.

Ph.J., 33, p. 379.

In England the public call Socliam Citro Tartrate, "Citrate of Magnesia" even though it contained no magnesia.

In a recent trial it was admitted that a well known solution commonly called "Citrate of Magnesia" was found to be Na Citre-tartrat and the seller was successfully, prosecuted.

Polk, C.G. 1873

Solution of Magnesium Citrate.

Drugg. Circ., 17, p. 41. (A.J.Ph., 46, p. 213; Proc. A.Ph.A., 21, p. 182.

A paper on an improved but cheaper formula for the preparation of solution of magnesium citrate.

Polk, C.G. 1874

Solution of Citrate of Magnesia.

Drugg. Circ., 18, p. 91;

Comments on the cost of preparing solution and the possible substitues.

Polk, C.G. 1874

Liquor Sodii Tartratis.

Drugg. Circ., 18, p. 155.

Discusses sodium tartrate as a substitutefor citrate of magnesia because of the cost of the citric acid.

Reichardt, A.F. 1874

Lead in Citric Acid, in Citrate of Magnesia, and in Lenson Syrup.

Drugg. Circ., 18, p. 155.

Shows how lead, as an impurity gets into this solution and comments on its bad effects.

Wharton, J.C. 1874

Solution of Citrate of Magnesium.

Tenn. Ph. Gaz., 4, p. 3. (Yr.Bk. of Br. Ph., 11, p. 379.)

Describes speedier process for preparing the above solution than the official method but yields the same product.

(Editor) 1875

Solution of Citrate of Magnesia.

Drugg. Circ., 19, p. 129.

Comments on formula for the preparation of this solution sent in by a reader.

Schlotterbeck, A.G. 1875

The Preparation of Solution of Citrate of Magnesium.

A.J.Ph., 47, p. 501. (Proc. A.Ph.A., 24, p. 81; Drugg. Circ., 20, p. 38; Am. J.Ph., 4, p. 501; Yr.Bk. Br. Ph. Conf., 12, p. 369.)

Discusses the U.S.P. formula for solution of Citrate of Magnesia and gives a slightly changed method for improving the preparation.

Wherlie, A.C. 1875

Practical Items, (Solution of Magnesium Citrate.)

Pharmacist, 8, p. 3. (Proc. A.Ph.A., 23, p. 75.)

A discussion of a change in the formula so that the $KHCO_3$ is not added until just before the preparation is dispensed.

Country Chemist. 1876

Solution of Citrate of Magnesium.

New Rem., 5, p. 280.

Suggests a formula for this solution along with some aids on the technique in preparation.

(Editor) 1876

Citrate of Magnesia.

Drugg. Circ., 20, p. 94.

An answer to a question concerning a method of preparing a solution of magnesium citrate. The solution is 1/6 weaker than the U.S.P. solution.

(Editor) 1876

Citrate of Magnesia.

Drugg. Circ., 20, p. 64.

Describes a method of avoiding the precipitation in preparing the solution and still use the U.S.P. directions.

(Editor) 1877

Substitutions.

A.J.Ph., 49, p. 206.

An editorial for official Solution of Magnesia Citrate condemning the talk and practise of making cheaper and easier preparations instead of the official.

Rhinehart, J. 1877

Substitute for Solution of Citrate of Magnesium.

A.J.Ph., 49, p. 100. (Drugg. Circ., 21, p. 84.)

In a letter states that a good substitute for Solution of Magnesium Citrate can be made by using Epsons Salts.

Watts, J.W. 1877

On Solution of Citrate of Magnesium.

A.J.Ph. 49, p. 99.

Methods by which the U.S.P. formula can be improved especially as to time needed in preparing the solution.

Wesley, W. 1877

Solution of Citrate of Magnesium.

A.J.Ph. 49, p. 161.

In a letter to the Editor disagrees with J.W. Watts on the same subject and also stating his satisfaction with the U.S.P. formula.

(Editor) 1878

Citrate of Magnesia.

Drugg. Circ., 22, p.95.

Comments on a formula for preparation of this product sent in by a reader.

Hager, H. 1878

Liquor Magnesiae Citricae.

Handbuck der Pharmaceutischen Peaxis, 1 Ed., p. 394.

Gives a formula for a solutions of magnesium citrate with other solutions of magnesia.

(Editor) 1879

Citrate of Magnesia.

Drugg. Circ., 23, p. 97.

Answers a question as to what the precipitate in this solution is.

Piquett, J.P. 1879

Citrate of Magnesia.

Drugg. Circ., 23, p. 173.

Gives another method and formula for the preparation of this solution.

Rother, R. 1879

Magnesium Citrate.

Pharm., 12, p. 400.

A discussion of various methods of preparing a fresh solution in a short period of time.

(Editor) 1880

Citrate of Magnesia.

Drugg. Circ., 24, p. 106.

In answer to a question comments on the permanancy of this solution.

Claassen, E. 1881

Qualitative analysis of a Solution of "Citrate" of Magnesia" sold by a New York Manufacturer.

New Rem., 10, p. 292.

A report of an analysis of a manufacturer's solution of magnesium citrate.

(Editor) 1881

Coloring Citrate of Magnesia.

Drugg. Circ., 25, p. 137.

In answer to a question concerning the coloring the solution red, says it may be all right, but not for prescriptions.

Fairthorne, R.F. 1882

Solution of Citrate of Magnesium.

A.J.Ph., 54, p. 65. (Proc. A.Ph.A., 30, p. 87.)

Gives a new formula for solution of magnesium citrate which uses light calcined magnesia.

(Editor) 1883

Citrate of Magnesia.

Drugg. Circ., 27, p. 25.

An answer to a question concerning the stability of this solution.

Parrish, E. 1884

Liquor Magnesii Citratis.

Treatise on Pharm. 5 Ed., p. 290; Ibid., 6 Ed., p. 216.

Discusses an unofficial method for preparing the above solution as well as the U.S.P. method.

(Editor) 1885

Solution Citrate Magnesia.

West. Drugg., 7, p. 246.

In answer to a question a few hints on how to speed up the preparation of solution of magnesium citrate.

Stevens, A.B. 1885

What is the Quality of Solution of Citrate of Magnesia furnished by manufacturers? How Much is Gained by Preparing it instead of Obtaining it from the Manufacturers?

Proc. Mich. State Ph.A., 3, p. 143. Dispens. U.S.A., 16 Ed., p. 913; Ibid., 17 Ed., p. 814; Ibid., 18 Ed., p.---; Ibid., 11 th Ed., p. 727; Ibid., 20 Ed., p. 649; Ibid. 21 Ed., p. 645.

A study of the precipitate formed in the solution and also the quantity of magnesia in commercial samples. Also the desirability of preparing solution instead of buying it from manufacturers.

Cohn, A. H. 1886

Laboratory Notes. Magnesii Citras Granulations.

A.J.Ph. 58, p. 235. (Proc. A.Ph.A. 34, p. 340.)

In a paper read at Pharm. meeting April 20th among other subjects which showed that commercial samples of this solution are contaminated with tartaric acid.

(Editor) 1886

Citrate of Magnesia Extemporaneously!

Drugg. Circ., 30, p. 83.

Ridicules the extemporaneous preparation of this solution.

Kaspar, O. 1886

Magnesia Citrica.

Schweizerische Wochenschrift fur Pharmacie, 24, p. 12. (A.J.P. 58, p. 128.)

Gives another method of preparing the soluble citrate of magnesia.

(Editor) 1887

Permanent Solution of Citrate of Magnesia.

Drugg. Circ., 31, p. 16.

Shows the benefits of making this solution by the U.S.P. method.

(Editor) 1887

Precipitation in Solution of Magnesium Citrate.

Drugg. Circ., 31, p. 109.

Gives what he considers the best method of avoiding a precipitate in preparing this solution and the technique involved.

Sennewald, F.W. 1887

Solution of Magnesium Citrate.

Nat. Drugg., 11, p. 214. (Dispens. U.S.A., 16 Ed., p. 913. Ibid., 17 Ed., p. 814; Ibid., 18 Ed., p. ---; Ibid., 19 Ed., p. 727; Ibid. , 20 Ed., p. 649; Ibid., 21, p. 645.

Suggests a modification of the official formula with a descriptive method for the manufacture.

(Editor) 1888

Stoppers for Magnesium Citrate Bottles.

Drugg. Circ., 32, p. 38.

Gives several views as to the right stopper to be used in bottling this solution.

(Editor) 1888

Cit Citrate of Magnesia.

Ph. Era., 2, p. 430.

A warning on how to properly store solution of magnesium citrate, so that the preparation will not taste flat.

Patch, L. E. 1889

Solution of Magnesium Citrate.

Proc. A.Ph.A., 37, p. 73. (A.J.Ph., 61, p. 438.)

Discusses the difficences in the Pharmacopoeia formula, and their various methods with changes to improve them.

Patch, L.E. 1889

Laboratory Notes.

West. Drugg., 11, p. 241. (Am. Drugg., 18, p. 226.)

Reports the results of an examination of the precipitate formed in solution of magnesium citrate and gives a formula for a "permanent" solution.

Stevens, L.F. 1889

Solution of Magnesium Citrate.

Drugg. Circ., 33, p. 245. (Ibid., 42, p. 42; Ibid., 44, p. 20; Ibid., 50, p. 170.)

A new formula for this solution with criticisms of the old formula.

Vogeler, A.G. 1889

Citrate of Magnesia.

West. Drugg., 11, p. 44.

A formula for the preparation of this solution for either extemporaneous preparation or preparation of a stock solution .

(Editor) 1890

Fungus in Solution of Citrate of Magnesium.

Drugg. Circ., 34, p.p. 159 & 253.

In answer to a question discusses the growths that form in this solution.

(Editor) 1890

Precipitation in Magnesium Citrate Solution.

Drugg. Circ., 34, p.p. 621, 229.

Discusses the precipitate which occurs in the solution.

Stevens, L.F. 1890

Solution of Magnesium Citrate.

Proc. A.Ph. A., 38, p. 213. (A.J.Ph., 62, p. 531; Drugg. Circ., 71, p. 438; Ph. Rec., 10, p. 436.)

A summary of the above solution including commercial impurities and theoretical chemistry.

Stevens, A.B. & Palmer, T . 1890

Solution of Magnesium Citrate.

Proc. Mich. Ph.A., 8, p. 58. (Drugg. Circ., 34, p. 283.)

Another formula for the preparation of a"better" solution of magnesium citrate.

(Editor) 1891

Changes in Magnesium Citrate Solution.

Drugg. Circ., 35, p. 230.

In answer to a question discusses the changes that take place in this solution as to precipitation and formation of growths in this solution.

(Editor) 1891

Magnesium Citrate Solution.

Drugg. Circ., 35, p. 61.

An article on the precipitate that forms and how the U.S.P. method will make a good product if small quantities are made.

Huber, J.E. 1891

Liquor Magnesii Citratis.

Proc. Ill. Ph.A., 12, p. 152; West. Drugg. p. 330. Proc. A.Ph.A., 40, p. 468; Drugg. Circ., 35, p. 249.

Discusses the extemporaneous preparation of Liquor Magnesii Citratis.

Ballard, J.W. 1892

A Good Ready Process for Solution of Citrate of Magnesia.

Ph. Rec., 14, p. 563.

Gives a new formula for the preparation of solution of Citrate of Magnesia.

Edel, F. 1892

Solution of Citrate of Magnesia, Prepared Extemporaneously.

Ph. Rec., 14, p. 463.

Gives a formula and describes the method of preparation of this solution which can be prepared in a few minutes.

(Editor) 1892

Solution of Citrate of Magnesia.

Ph. Rec. , 14, p. 462.

Gives a formula for the preparation of this cathartic and discusses the chemistry involved.

(Editor) 1892

Solution Citrate of Magnesia.

Ph. Era., 8, p. 238.

Recommends a slightly modified formula for the preparation of this solution.

(Editor) 1892

Solution of Magnesium Citrate.

Drugg. Circ., 36, p. 157.

A discussion of the formulas of the U.S.P. and other pharmacopoeias for this solution.

Kut, T.S. 1892

Solution of Citrate of Magnesia.

Ph. Rec., 14, p. 463.

Describes a method of preparing this solution using 2 stock solutions which are mixed when the solution is called for.

Scoville, W.T. 1892

A Formula for the Rapid Preparation of Solution of Citrate of Magnesia.

Ph. Rec. 14, p. 462. (Proc. A.Ph. A., 41, p. 782; Dispens. U.S.A. 17 Ed., p. 813; Ibid., 19 Ed., p. 726.)

Gives a formula for the preparation of the above product.

Thomas, J.W. 1892

Improved Formula for Solution of Citrate of Magnesia.

Ph. Rec., 14, p. 563.

A formula for preparing the above solution using magnesium sulfate, with the claim it is changed to citrate by excess of citric acid.

(Editor) 1893

Stringy Deposit in Magnesium Citrate Solution.

Drugg. Circ., 37, p. 37.

The microorganisms which form in this solution may be eliminated by boiling.

Tunana, G. 1893

Liquor Magnesiae Carbonatis.

Chem. & Drugg. 42, p. 72.

Discusses the advisability of changing the type of bottle to dispense this solution into a syphon instead of the regular bottle or using glycerine as a preservative for folding CO_2 in the solution.

Coblentz, V. 1894

Liquor Magnesii Citratis.

Handbook of Pharmacy, 1 Ed., p. 235; Ibid., 2 Ed., p. 235.

A general discussion on the preparation of this solution using the U.S.P. Formula.

(Editor) 1894

Solution of Magnesium Citrate.

Drugg. Circ., 38, p. 182.

A recognition of the difficulty in preparing this solution and suggesting various methods that may be used in overcoming them.

Widlum, A.I. 1895

Improved Solution of Magnesium Citrate

Proc. N. Dak. Ph. A., 10, p. 40. (Dispens. U.S.A., 19 Ed., p. 725.)

Gives a process for making an extemporaneous solution, using 2 solutions and mixing them just before using.

(Editor) 1897

Magnesium Citrate Solution.

Drugg. Circ., 41, p. 104.

In answer to a question comments on a faulty formula for preparing magnesium citrate solution.

Dorvault,----. 1898

Citrate de Magnesie.

L'Officine, 17 Ed., p. 592. (A.J.P., 96, p. 657.)

Discusses the French codex formula for the preparation of citrate of magnesia with a description, an assay, and uses of the solution.

(Editor) 1898

Precipitation of Magnesium Citrate.

Drugg. Circ., 42, p. 42.

An answer to a question concerning the precipitate in this solution makes suggestions as how to prepare fairly stable solution.

Kastle, J.H. 1898

Solution of Magnesium Citrate.

J. Am. Chem. Soc., 20, p. 97; (J.A.Ph.A., 21, p. 135.)

A study of the chemistry of the various precipitates that form in the preparation of the above solution.

(Editor) 1899

Stock Solution of Magnesium Citrate.

Am. Drugg., 35, p. 75.

Discusses a method of preparing a stock solution of magnesium citrate in which the potassium carbonate is protected by a layer of syrup from the action of citric acid.

Kebler, T.F. 1899

Magnesium Citrate, Effervescing Adulterated with Magnesium Sulphate.

A.J.P., 71, p. 545. (Ph. Era., 22, p. 699.)

Discusses actual adulteration of a cheap solution of magnesium citrate with magnesium sulphate.

Schmidt, J.H. 1899

Letter to the American Pharmaceutical Association Committee on Practical Pharmacy.

Proc. A.Ph.A., 47, p. 173. (Drugg. Circ., 43, p. 223; Ph. J. 63, p. 360; Bull. Ph., 13, p. 471.)

In a letter to Henry P. Hynson reports sterilizing aid in the preparation of this solution.

(Editor) 1900

Precipitation in Magnesium Citrate Solution.

Drugg. Circ., 44, p. 20,

In answer to a query from a reader discusses the troubles that may arise in preparing this solution and the means of overcoming these difficulties.

(Editor) 1900

Solution of Magnesium Citrate.

Bull. Ph., 14, p. 299.

Discusses various formulas for preparing the above solution and their ratios of Magnesium Carbonate to citric acid.

Gerard, E. 1900

Lemonade Purgative au Citrate de Magnesie.

Pharmacie Galenique, 1 Ed., p. 143. Ibid., 2 Ed., p. 155.

Gives a formula for the French solution corresponding to the American Solution of Magnesium Citrate.

Scoville, W. L. 1900

Effervescing Citrate of Magnesium.

A.J.Ph., 72, p. 175. (Proc. A.Ph.A., 48, p. 501; Drugg. Circ., 44, p. 140; Ph. Era, 23, p. 393; Am. Drugg., 35, p. 75; Ibid., 36, p. 205.)

Discusses the adulteration of effervescing citrate of magnesium and gives reasons why the preparation should be made to contain magnesium sulfate.

Bache, B.F. 1901

Solution of Magnesium Citrate.

Drugg. Circ., 45, p. 217. (Ibid., 46, p. 107.)

Describes how a good solution can be made and names the commercial ingredients to use.

Claasen, E. 1901

Solution of Magnesium Citrate.

Am. Drugg. 39, p. 80.

Discusses the method of preparing the official solution of citrate of magnesia.

Hague, G.W. 1901

Note on Solution of Magnesium Citrate.

Merck's Rep., 10, p. 115. (Proc. A.Ph.A., 49, p. 579; Bull. Ph., 15, p. 299; Am. Drugg., 37, p. 226.)

Gives a formula for extemperaneous preparation of solution of magnesium citrate.

Williams, J.K. 1901

Solution Citrate Magnesia.

Proc. Conn. Ph.A., 25, p. 85. (Am. Drugg., 37, p. 40.)

Gives a formula for the above preparation with a unique method of preparation.

(Editor) 1902

Solution of Magnesium Citrate.

Drugg. Circ., 46, p. 107.

In answer to a question gives a good way of preparing this solution with cautions to be observed.

Huber, J.E. 1902

Solution of Magnesium Citrate.

Drugg. Circ., 46, p. 202. (Proc. A.Ph.A., 51, p. 636.)

Discusses the best type magnesium citrate to use in the preparation and various methods of preparation.

Sayre, H.L. 1902

Magnesium Citrate Solution.

West. Drugg. 24, p. 10. (Ph. J., 68, p. 496; Bull. Ph., 17, p. 125.)

Describes the method of preparing this solution according to the recommended formula.

(Editor) 1903

Magnesium Citrate.

Drugg. Circ., 47, p. 260.

Explains a probable mistake that may have occurred in preparing this solution and reasons for it in answer to questions by a reader.

(Editor) 1903

Permanent Solution of Magnesium Citrate.

West. Drugg. 25, p. 674.

In answer to a question, explains the method of sterilizing this solution.

Ruhl, H.F. 1903

Solution of Citrate of Magnesia.

Proc. Penn. Ph.A., 26, p. 107. (Bull. Ph., 17, p. 39.)

Suggests a formula for this solution especially for stores that do not stock syrup of citric acid.

Brunor, E. 1904

Magnesium Citrate.

Chem. & Drugg., 65, p. 498.

Suggests making a concentrated solution so that it can be diluted when dispensed.

Brunor, E. 1904

Improved Process for Solution of Magnesium Citrate.

Proc. A.Ph.A., 52, p. 449. (Ph. J. 73, p. 661; Ph. Rev., 22, p. 334; Drugg. Circ., 49, p. 48; Ibid., 50, p. 170. Bull. Ph., 18, p. 509; Am. Drugg. 61, p. 40.)

Discusses a new formula for the preparation of this soluble and criticizes the older formulas.

(Editor) 1904

Solution of Magnesium Citrate.

Drugg. Circ., 48, p. 41.

Discusses the precipitate that occurs in this solution and means of preventing it.

(Editor) 1904

Solution of Magnesium Citrate, Precipitate Jn.

Nat. Drugg. 34, p. 166.

In answer to a question by a reader, explains the various precipitates that occur in this solution.

(Editor) 1904

Moulding of Solution of Magnesium Citrate.

Drugg. Circ., 48, p. 207.

Gives a means of eliminating moulds in this solution by boiling the water before using.

(Editor) 1904

Solution of Magnesium Citrate.

Drugg. Circ., 48, p. 254.

Finds fault with various formulas and the ways of eliminating these troubles.

Fralinger, J.J. 1904

Precipitate of Magnesium Citrate.

Nat. Drugg. 34, p. 195.

An answer to a question concerning a precipitate in the solution which was made according to the U.S.P. directions.

Hain, F.W. 1905

Solution of Magnesium Citrate.

Bull. Ph., 19, p. 472. (Proc. A.Ph.A., 54, p. 642.)

A discussion of a method of preparation which includes the addition of the $KHCO_3$ just before delivery of the solution.

Johnson, W.S. 1904

Solution of Magnesium Citrate.

West. Drugg. 26, p. 306.

Describes a method of preparing a stock preparation of this solution.

(Editor) 1905

The original Solution of Magnesium Citrate.

Drugg. Circ., 49, p. 56.

Gives the U.S.P. history of the solution, comments on the various changes.

Hain, F.W. 1905

Solution of Magnesium Citrate.

Bull. Ph., 19, p. 472.

Gives a formula for this solution with detailed directions for its preparation and storage.

Stuchlik, J. 1905

Solution of Magnesium Citrate.

West. Drugg., 27, p. 97. (Proc. A.Ph.A., 53, p. 577.)

Describes a method of preparation in which sterilization of the bottle and contents is emphasized.

"Apothecary" 1906

A Method of Preparing Solution of Magnesium Citrate.

Bull. Ph., 20, p. 165.

Gives a formula for preparing this solution and despensing it when asked for.

Baird, E.G. 1906

(Solution of Magnesium Citrate-A Concentrated Form for Stock.)

Proc. Miss. Ph.A.,---, p. 41. (Proc. A.Ph.A., 55, p. 672.)

(Discusses the preparation of a concentrated solution which may be diluted and used when the official solution is called for.)

Caspari, C. Jr. 1906

Solution of Magnesium Citrate.

Treatise on Pharm., 3 Ed., p. 541; Ibid., 4 Ed., p. 601; Ibid., 8 Ed., p. 244.

Discusses the U.S.P. method of preparing this solution with helpful hints for beginners.

(Editor) 1906

Solution of Magnesium Citrate.

West. Drugg. 28, p. 607.

In answer to a question on when to filter this solution says it should be done before adding the syrup.

(Editor) 1906

Trouble with Solution of Magnesium Citrate.

Drugg. Circ., 50, p. 170.

A discussion of the work done and words spent on the faults of this solution and their new formula for this preparation.

(Editor)

Solution of Magnesium Citrate.

Bull. Ph. 20, p. 262.

In answer to a letter complaining about the short time this solution keeps emphasizes the fact that it should not be kept for over 10 days.

Nagle, T.S. 1906

Solution of Magnesium Citrate-Novel Method of Preservation Ready for Dispensing.

Proc. Penn. Ph.A., 38, p. 246. (Proc. A.Ph.A., 55, p. 673; Bull. Ph., 21, p. 84; A.J.Ph., 78, p. 385.)

Gives a method of preparing this solution so that the contents of the bottle do not mix until shaken just before using.

Doyle, M.E. 1907

Filtering Solution of Magnesium Citrate.

Drugg. Circ., 51, p. 367.

The technique of preparing and filtering this solution, is discussed, and special attention is paid to details.

(Editor) 1907

Magnesium Citrate at the Soda Fountain.

Drugg. Circ., 51, p. 598.

Describes the ways and means of having this laxative available so it can be dispensed at the fountain.

(Editor) 1907

Filtering Solution of Magnesium Citrate.

Drugg. Circ., 51, pp. 311, 367, 417.

Describes the technique to be employed in filtering this solution.

(Editor) 1907

A Stock Solution of Magnesium Citrate.

Bull. Ph., 21, p. 307.

In answer to the question "can this solution be kept for 2 weeks," quotes the U.S.P. to the effect that this solution must be freshly made.

Merin, A.T. 1907

Filtering Solution of Magnesium Citrate.

Drugg. Circ., 51, p. 417.

In filtering this solution uses talc.

Moderow, O.C. 1907

The Extemporaneous Preparation of Solution of Magnesium Citrate.

Bull. Ph., 21, p. 337.

Discusses another new formula for this solution which includes making a stock solution and mixing on call.

Dudman, F.E. 1908

Solution of Magnesium Citrate.

Drugg. Circ., 52, p. 380; Ibid., 53, p. 24.

Gives a new method and technique for preparing this solution.

(Editor) 1908

A Stock Solution of Magnesium Citrate.

Bull. Ph., 22, p. 86.

In answer to a query concerning a stock solution suggests using the one developed by Moderow, O.C.

(Editor) 1908

A Clear Solution of Magnesium Citrate.

Bull. Ph., 22, p. 173.

A suggestion to a reader to use Brunor's formula in preparing solution.

Bunting, G.A. 1909

Effervescent Solution of Magnesium Citrate.

Bull. Ph., 23, p. 433. (Ibid., 24, p. 117.)

Gives a formula for this preparation and claims that it keeps with praise for the fact that it keeps longer than when made by other formulas.

Daniel, R.P. 1909

Solution of Magnesium Citrate.

Drugg. Circ., 53, p. 24.

Calls attention to the advantages of sterilizing this solution.

Daniel, R.P. 1909

Another Letter on Solution of Magnesium Citrate.

Bull. Ph., 23, p. 343.

Presents another formula for the quick preparation of this solution.

Spire, W.B. 1909

To Retard Precipitation in Solution of Magnesium Citrate.

Bull. Ph., 23, p. 299. (Ibid., 24, p. 117.)

Describes a method of dispensing that will make this solution much more stable.

Touhy, J.T. 1909

Rapid Method of Making Solution of Magnesium Citrate Extemporaneously.

Bull. Ph., 23, p. 254. Ibid., 24, p. 117; Ibid., 31, p. 262; Ibid., 39, p. 381.

Describes a clever method of preparing this solution with detailed instruction.

Burge, J.O. 1910

Solution of Magnesium Citrate.

Bull. Ph., 24, p. 117.

Describes a quick method of preparing this solution and the technique required.

Carpenter, H.S. 1910

Once Again: Effervescent Solution of Magnesium Citrate.

Bull. Ph., 24, p. 430. (Proc. A.Ph.A., 59, p. 77.)

Another discussion of a method of preparation in which the modification includes withholding the $KHCO_3$, until just before dispensing the product.

Hager, H. 1910

Liquor Magnesii Citrici.

Handbook der Pharmaceutischen Proxis, 2 Ed., V.2, p. 325.

Discusses a formula for a solution very similiar to the U.S.P. formula along with several other solutions of magnesium salts.

Martin, T.T. 1910

Making Solution of Magnesium Citrate.

Bull. Ph., 24, p. 517.

Gives another formula for the preparation of this solution.

Mc Anulty, J.F. Jr. 1910

Solution of Magnesium Citrate-A Preparation of Stability by a Slight Modification.

Merck's Rep., 19, p. 309. (Proc. Am. Ph. A., 59, p. 76.)

Discusses a modified formula for the preparation of the solution in which the order of mixing is important.

Thum, J.K. 1910

Liquor Magnesii Citratis.

Am. Drugg. 57, p. 130.

Gives a method of preparation of this solution which will yield stable product due to sterilizing the ingredients and bottles.

Allen, M.D. 1911

Liquor Magnesii Citratis.

A.J.P., 83, p. 564. (Proc. A.Ph.A., 59, p. 76; West Drugg., 34, p. 563.)

The manufacture of Solution of Magnesium Citrate by the average druggist with all the difficulties encountered is unsatisfactory.

(Editor) 1911

Stable Solution of Magnesium Citrate.

Drugg. Circ., 54, p. 80.

Emphasizes the neccessity of sterilizing the bottles and solution and also described the method.

Davies, J.J. 1911

Solution of Magnesium Citrate.

Drugg. Circ., 55, p. 568.

The value of potassium bicarbonate as a preservative and an aid to palatability in this solution is brought out.

Beringer, G.M. 1912

Solution of Magnesium Citrate.

West. Drugg. 34, p. 562.

Gives a formula for the preparation of this solution in which emphasis is placed on the sterilizing the solution and the bottle.

Cadmus, R.C. 1912

Solution of Magnesium Citrate.

West. Drugg., 34, p. 563.

Gives a method of preparation which contains a slight variation from the official method.

Cliffe, W.T. 1912

Solution of Magnesium Citrate.

West. Drugg., 34, p. 563.

Gives a new formula for the preparation with detailed directions.

Cuthbert, R.W. 1912

Solution of Magnesium Citrate.

West. Drugg., 34, p. 563.

Discusses a method of preparing this solution placing special emphasis on sterility.

(Editor) 1912

Solution of Magnesium Citrate.

Drugg. Circ., 56, p. 675.

A discussion of the U.S.P. preparation and method of preparing the solution.

England, J.W. 1912

Solution of Magnesium Citrate.

West. Drugg., 34, p. 562.

Discusses various methods of improving this solution.

Fritzinger, R.J. 1912

Solution of Magnesium Citrate.

Drugg. Circ., 56, p. 312. (Yr. Bk. Br. Ph., 49, p. 337.)

Describes a method of preparing this solution on a commercial scale with the technique and formula used.

"Jay Ess" 1912

Solution of Magnesium Citrate.

Drugg. Circ., 56, p. 78, p. 148.

Stresses the value of sanitary equipment and materials in making this solution.

Klopp, H.T. 1912

Solution of Magnesium Citrate.

West. Drugg. 34, p. 563.

A discussion of the best form of Magnesia to use in making solution.

Lee, W.E. 1912

Solution of Magnesium Citrate.

West. Drugg., 34, p. 563.

Gives a method of preparing this solution which is believed to be superior to other methods.

Tanner, T.B. 1912

Solution of Magnesium Citrate.

West. Drugg., 34, p. 564.

Discusses a method of preparation of this solution which is a modification to official formula.

(Editor) 1913

Solution of Citrate of Magnesia.

Am. Drugg., 61, p. 40.

In answer to a query by a reader states that sterilization is an important part of the manufacture of this solution.

(Editor) 1913

Effervescent Citrate of Magnesia.

Ph.J., 91, p. 371.

A summary of the various commercial methods of preparing this solution.

(Editor) 1913

Solution of Magnesium Citrate.

Drugg. Circ., 57, p. 749.

A warning that this solution should not be dispensed when old and an explanation of the reasons.

Mc Anulty, J.F. 1913

Effervescent Solution of Citrate of Magnesia.

Proc. N.J. Ph.A., 43, p. 44; (Yr. Bk. A.Ph.A., 2, p. 58.)

Suggests a modified formula for the preparation of this solution.

Brown, J.T. 1914

Liquor Magnesii Citratis.

Jour. A.Ph.A., 3, p. 968. (Yr.Bk.A.Ph.A., 3, p. 71.)

Gives a formula for the above preparation and emphasizes boiling the solution and filtering while hot.

(Editor) 1914

Solution of Magnesium Citrate.

Bull. Ph., 28, p. 44.

In answer to a question concerning how to make solution of magnesium citrate permanent, says that by withholding the potassium bicarbonate and the solution will remain permanent from 1-3

(Editor) 1914

Solution of Magnesium Citrate.

Drugg. Circ., 58, p. 150.

Lists and discusses the variations of this official preparation and their faults.

Possehl, J.J. 1914

(Liquor Magnesii Citratis.)

Proc. Wis. Ph.A., 34, p. 78. (Yr.Bk.A.Ph.A., 3, p. 71.)

(Gives a new method of preparation of this solution with a slight deviation from the official formula.)

(Editor) 1915

A Rapid Method for Making Solution of Magnesium Citrate.

Bull. Ph., 39, p. 318.

An answer to the question "what is a good method for making solution of magnesium citrate extemporaneously."

Fellows, E.W. 1915

Permanent Solution of Magnesium Citrate.

Bull. Ph., 29, p. 487. (Yr. Bk. A.Ph.A.,)

The sterilization of the solution is said to be the secret of making it stable.

Bloomberg, C. 1916

Solutio Citratis Magnesici.

Ph. Weekblad, 53, p. 1382. (Yr. Bk. A.Ph.A., 5, p. 75.)

States a claim made that Holland Pharmacoepia has no standard for magnesium carbonate and this is the trouble with their solution of magnesium citrate.

(Editor) 1916

Making Citrate of Magnesia in Large Quantities.

Bull. Ph., 30, p. 126.

Discusses a formula and process for the manufacture of this solution on a large scale.

(Editor) 1917

Caution Against Explosion in New Process for Magnesium Citrate.

Drugg. Circ., 61, p. 60. (Yr.Bk. A.Ph.A., 6, p. 87.)

Warns against the use of Sodium Bicarbonate in powdered form in preparing solution of Magnesium Citrate.

(Editor) 1917

Insoluble precipitate in Solution of Magnesium Citrate.

Drugg. Circ., 61, p. 81.

A discussion of the reactions involved in preparing this solution.

(Editor) 1917

"Permanent"Solution of Magnesium Citrate.

Drugg. Circ., 61, p. 633.

The chief difficulty in connection with this solution is that is is not permanent so discusses various methods that have been suggested to overcome this difficulty.

(Editor) 1917

Producing Quantities of Citrate of Magnesia.

Bull. Ph., 31, p. 131.

In answer to a question describes thetype of dish to use for the manufacture of this solution.

Burrows, A.B. 1918

Proc. Drugg. 36, p. 176. (Bull. Ph., 32, p. 41.)

Describes a method of filtering and bottling this solution by using a percolator and syphon effect.

(Editor) 1918

Price of Solution of Citrate of Magnesia.

Bull. Ph., 32, p. 350.

Discusses the price of this solution in the various parts of the country and probable reasons for the differences.

Bartleson, R. 1919

Behind the Prescription Counter.

Proc. Minn. Ph.A., 35, p. 146. (Drugg. Circ., 63, p. 62.)

The technique used in preparing this solution is given in a paper on general technique behind a prescription counter.

Herzfeld, H. 1919

Solution of Magnesium Citrate.

Ph. Era, 52, p. 48. (Yr. Bk. A.Ph.A., 8, p. 93.)

Gives a formula for a solution called "Limonada Roge," and used in Argentina. It does not effervese but is claimed to be superior to our preparation.

Horn, W.F. 1919

Liquor Magnesii Citratis.

Proc. Penn. Ph.A., 42, p. 228. (Drugg. Circ., 64, p. 94.)

Describes a modified method of preparing this product with the claims that a better product is produced.

Mayer, J.L. 1920

Analysis of Solution of Magnesium Citrate.

J.A.Ph.A., 9, p. 253; Nat. Drugg., 50, p. 244; Yr.Bk. A.Ph.A., p. 106.

Reports the results of the analysis of samples of this solution with a modified method of assaying.

Remington, J.P., Wood, H.C. and others. 1920

Liquor Magnesii Citratis U.S.

Dispens. U.S.A., 20 Ed., p. 647; Ibid., 21 Ed., p. 643; Ibid., 22 Ed., p. 626.)

The U.S.P. IX. formula provides for sterilization of the bottle and ingredients to destroy bacteria.

(Editor) 1922

Magnesium Oxide in Place of the Carbonate in Making Solution of Magnesium Citrate.

Drugg. Circ., 66, p. 140.

Discusses the substitution of Magnesium oxide for magnesium carbonate in preparing the solution of magnesium citrate.

(Editor) 1923

Special Solution of Magnesium Citrate.

Drugg. Circ., 67, p. 450.

Gives an account of a prescription written by a doctor for a solution similar to the official one.

(Editor) 1924

Amount of Magnesium Citrate in Official Solution.

Drugg. Circ., 68, p. 159.

Discusses the form of and amount of magnesium citrate in the official solution of magnesium citrate.

(Editor) 1924

Solution of Magnesium Citrate from Milk of Magnesia.

Bull. Ph., 38, p 131.

Describes a method using milk of magnesia instead of magnesium carbonate in preparing the above solution.

England, J.W. 1924

The Excessive Acidity of the Official Solution of Magnesium Citrate .

A.J.Ph., 96, p. 657. (Yr.Bk.A.Ph.A., 13, p. 61.)

Considers in detail the acidity of the solution and why it and other changes should be made in present formula.

Halbustadt, T. 1924

Dispensing Citrate of Magnesia.

Bull. Ph., 36, p. 526.

Suggests that this solution be dispensed with a tablet of potassium bicarbonate added just before handing out.

Pemberton, E.A.Jr. 1924

Formulas that Have Made Money for Me.

Bull. Ph., 38, p. 256.

Gives a formula for Solution of Citrate of Magnesia, a stock solution, as the leader of the list of formula that have made him money.

(Editor) 1925

An inexpensive "Solution of Magnesium Citrate."

Drugg. Circ., 69, p. 466.

Mentions a number of substitues for this rather expensive solution and their faults.

Scoville, W.T. 1925

Concerning Solution of Magnesium Citrate.

A.J.Ph., 97, p. 80. (Yr.Bk.A.Ph.A., 14, p. 55.)

A Bulletin submitted to the Committee of Revision of the U.S.P. contain a discussion of changes in the U.S.P. X formula dealing with the acidity of the preparation, and a comparison of formulas of French and American Pharmacopeias.

Rook, E.F. & La Wall, Ch. 1926

Liquor Magnesii Citratis.

Remington's Practice of Pharmacy, 3 Ed., p. 613; Ibid., 4 Ed., p. 586; Ibid., 5 Ed., p. 574; Ibid., 6 Ed., p. 574; Ibid., 7 Ed., p. 253.

A detailed discussion of the preparations fully explaining the official method and formula.

England, J.W. 1926

Solution of Magnesium Citrate U.S.P.X.

A.J.Ph., 98, p. 91. (Dispens. U.S. A., 22 Ed., p. 626.)

The U.S.P.X formula for Solution is discussed and special attention to the acidity of the solution.

(Editor) 1926

Solution of Magnesium Citrate.

Drugg. Circ., 70, p. 728; Ibid., 74, Jan. p. 21.

Discusses the various difficulties encountered in preparing this solution and the means of overcoming them.

(Editor) 1927

The New Formula for Solution of Magnesium Citrate.

Drugg. Circ., 71, p. 894.

Favors the present U.S. formula and tells how well it has worked.

Neimeth, E. 1927

Formulas for Magnesium Citrate Solution.

(Drugg. Circ., 71, p. 332; Messingu, 6, p. 189; Dispens. U.S.A., 22 Ed., p. 626; J.A.Ph.A., 21, p. 135.) Yr. Bk. A.Ph.A. 16, p. 72.

Discusses the advantage of increasing the amount of citric acid in this preparation.

Seltzer, L.A. 1927

Formula for Magnesium Citrate Solution.

Drugg. Circ., V.71, p. 438. (J.A.Ph.A., 21, p. 135; Yr.Bk. A.Ph. A., 16, p. 73.)

Favors the U.S.P.X. formula for the solution of magnesium citrate.

Phillip, W.B. 1929

Refilling Magnesium Citrate Bottles.

Ph.Era., 66, p. 262. (Yr.Bk.A.Ph.A., 18, p. 32.)

Approves using old or already used bottles which had previously contained the identical product.

Arny, H.V. & Schaefer, H.H. 1930

The Citric Acid "Assay " of Solution of Magnesium Citrate U.S.P.

J.A.Ph.A., 19, p. 941. (Dispens. U.S.A., 22 Ed., p. 627. (Yr.Bk.A.Ph.A., 19, p. 41.)

Discusses the assay of citric acid in solution of magnesium citrate, and why it is necessary.

Langenhon, H.A. 1930

Solution of Magnesium Citrate.

U.S.P. Bull. Subcommittee 12, p. 18. (J.A.Ph.A., 21, p. 135.)

The original was not available.

Rees, E.W. 1930

Solution of Magnesium Citrate.

A.J.Ph., 102, p. 496. (Dispens. U.S.A., 22 Ed., p. 627, J.A. Ph.A., 21, p. 135.)

A study of the effects of long standing on the solution and also various precipitates formed.

Stanford, F.G. 1930

Solution of Magnesium Citrate That Will Keep.

Drugg. Circ., 74, Feb. p. 46. Ibid., May p. 24.)

Describes a different process for preparing this preparation which needs no heat and should not be stirred.

Haussmann, H.W. 1931

Assay of Magnesium Citrate.

A.J.Ph., 103, p. 44.

In a thesis submitted to the Philadelphia College of Pharmacy and Science discusses the possible methods for assaying solution of Magnesium Citrate.

Kaplan, B.W. 1931

Solution of Magnesium Citrate That Will Keep.

Drugg. Circ., 75, p. 21.

Sterilization of this preparation will permit the solution to be kept for some time.

Kleenschmidt, F. 1931

Comments on Solution of Magnesium Citrate.

J.A.Ph.A., 20, p. 47. (Yr.Bk.A.Ph.A., 20, p. 37.) Drugg. Circ., 75, May, p. 63;

Comments on a modified formula which includes beating the solutionto 150° F With the formation of invert sugar.

Oakley, M. & Krantz J.C. jr. 1932

A Physicochemical Study of Solution of Magnesium Citrate.

J.A.Ph.A., 21, p. 132. (Dispens. U.S.A., 22 Ed., p. 626; Yr.Bk.A.Ph.A., 22, p. 180.)

A study of the physicochemical aspects involved in the preparation of the solution and the acid taste of the solution.

Osol, A. & Tice, T.F. 1936

A Study of Solution of Magnesium Citrate.

A.J.Ph. A., 108, p. 396. (J.A.Ph.A., 25, p. 1108; Ph.Abstr., 3, p 135.)

A study of the several product resulting from present formula by varying the process.

Reindollar, W.F. & Chaney, H.E. 1936

Magnesium Citrate - Modified Assay for Solution of.

J.A.Ph.A., 25, p. 95; Ph.Abst., 2, p. 213.

A criticism of the former methods of assay and praise of present method of assay.

Arny, H.V. & Fischellis, R.P. 1937

Liquor Magnesii Citratis.

Principles of Pharmacy, 4 Ed., p. 517.

Detailed discussion of the formula and official method of preparation eith helpful hints for making the preparation.

List of Journals Consulted

Am(erican) Drugg(ist) (13-22), (1884-1892).

Am(erican)Drugg(ist) (and) Ph(armaceutical) Re(cord) (22-78), (1892-1938)

Am(erican) Drugg(ist) Circ(ular) (1-82), (1857-1938)

Am(erican) Jour(nal) (of) Ph(armacy) (1-110), (1825-1938)

Bull(etin) of the Ph(armacy) (7-42), (1893-1928)

Chem(ist) & Drugg(ist) (1-128), (1859-1938)

Drug Bull(etin) (50-55), (1928-1933)

Merck's (Market) Re(port) (& Pharmaceutical Journal) (1-39), (1892-1930)

Nat(ional) Drugg(ist) (12-66), (1888-1936)

New Rem(edies) (1-12), (1872-1882)

Ph(armaceutical) Abstracts (1-4), (1935-1938)

Ph(armaceutical) Era (1-67), (1887-1930)

Ph(armaceutical) Rec(ord) (3-15), (1883-1893)

(The) Ph(armaceutical) Rev(iew) (1, 2, 14-26) (1892, 1893, 1896, 1908)

Ph(armaceutical) Journ(al & Transactions) (1-141) (1841-1948)

(The) Pharm(acist) (and Chemist) (1-18), (1868-1885)

Proc(eedings) A(merican) Ph(armaceutical) A(ssociation) (1-59), (1851-1911)

Proc(eedings) of the Br(itish) Ph(armaceutical) Conf(erence) (1-64), (1864-1927)

West(ern) Drugg(ist) (4-50), (1882-1928)

(Year Book) Yrbk. (of the) A(merican) Ph(armaceutical) A(ssociation) (1-23), (1912-1924)

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Arny, H.V., Principle of Ph(armacy) 4 ed., 1937.

Caspari, C. Treatise on Ph(armacy) 3 ed.,1906; 4 ed., 1909; 8 ed., 1936 .

Coblentz, V. Handbook of Ph(armacy) 1 ed., 1894.

Coxe, F.R. (The Am(erican) Dispens(atory) 1 ed., 1806; 4 ed., 1818; 6 ed., 1825; 7 ed., 1827; 8 ed., 1830; 9 ed., 1831.

Dorvault, T. L'Officine, 17 ed., 1898.

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UNITED STATES PHARMACOPOEIA
(U.S.P.) (1810-1930) (O-XI)

and

NATIONAL FORMULARY
(N.F.) (1888-1935) (1-VI)

HISTORY

OF

LIQUOR MAGNESIA CITRATIS

U.S.P. 1850 p. 167

Liquor Magnesiae Citratis
Solution of citrate of Magnesia

Take of magnesia two drachms; citric acid seven drachms and a half; syrup of citric acid two fluidounces; Bicarbonate of Potassa, in crystals, two scruples; Water, a sufficient quantity

Dissolve the citric acid in four fluidounces of/ water, and, having added the magnesia, stir till it/ is dissolved. Filter the solution into a strong glass/ bottle, of the capacity of twelve fluidounces, into which the syrup of citric acid has been pre-/viously introduced; then add the bicarbonate of/potassa and sufficient water nearly to fill the/ bottle, which is to be tightly corked and secured with twine. Lastly, shake the mixture occassion/ally until the Bicarbonate is dissolved.

U.S.P. 1860 p.224.

Liquor Magnesiae Citratis
Solution of Citrate of Magnesium

Take of Magnesiae one hundred and twenty grains; Citric acid four hundred and fifty grains; syrup of citric acid two fluidounces; Bicarbonate of potassa forty grains; Water a sufficient quantity.

Dissolve the citric acid in four fluidounces of/ water, and, having added the magnesia, stir until/ it is dissolved. Filter the solution into a strong/ twelve ounce bottle, containing the syrup of citric/ acid. Then add the bicarbonate of potassa and/ sufficient water to nearly fill the bottle, which/ must be closed with a cork, secured with twine. Lastly, shake the mixture occassionally until the bicarbonate is dissolved.

U.S.P. 1870 p. 217.

Liquor Magnesii Citratis

Take of carbonate of magnesium two hundred grains; citric

acid four hundred grains; syrup of citric acid two fluidounces; bicarbonate of Potassa forty grains; Water sufficient quantity

Dissolve the citric acid in four fluidounces of water,/ and, having added the carbonate of magnesium, stir/ until it is dissolved. Filter the solution into a strong twelve-/ounce bottle, containing syrup of citric acid. Then/ add the bicarbonate of Potassium, and enough water to/ nearly fill the bottle, which must be closed with a cork/ secured with twine. Lastly shake the mixture occassionally until the Bicarbonate is dissolved.

U.S.P. 1880 p. 203.

Liquor Magnesii Citratis
Solution of Citrate of Magnesium

	grains	grams
Carbonate of Magnesium two hundred grains.....	200	13.00
Citric acid four hundred grains.....	400	26.00
Syrup of citric acid, twelve hundred grains..	1200	80.00
Bicarbonate of Potassium, in crystals, thirty	30	2.00
Water a sufficient quantity.		

Dissolve the citric acid in two thousand 2000 grains or about one/ hundred and twenty grammes of water and having added the carbonate of magnesium, stir until its dissolves. Filter the solution into a/ strong bottle of the capacity of twelve (12) fluid ounces, or about three hun/dred and sixty (360) cubic centimeters containing the syrup of citric acid./ Then add enough water, previously boiled and filtered, to nearly fill the/ bottle chop in the bicarbonate of potassium/ and immediately , close the/ bottle with a cork, which must be secure with twine. Lastly, shake the/ mixture occassionally until the bicarbonate of potassium is dissolved.

U.S.P. 1890 p. 237.

Liquor Magnesii Citratis
Solution of Magnesium Citrate

Magnesium carbonate fifteen grammes.....15.0 gms.
Citric Acid thirty grammes.....30.0 gms.
Syrup of citric acid one hundred and twenty cubic centimeters.....120.0 cc.

Potassium bicarbonate two and one-half grammes 2.5 gms.
Water a sifficient quantity.

Dissolve the citric acid in one hundred and twenty (120) cubic centi/meters of water, and, having added the magnesium carbonate, stir/ until it is dissolved. Filter the solution into a strong bottle of the/ capacity of about three hundred and sixty (360) cubic centimeters, con/taining the syrup of citric acid. Then add enough water to nearly/ fill the bottle drop in the potassium bicarbonate immediately close/ the bottle with a cork, and secure it with twine. Lastly shake the mixture occassionally, until the potassium bicarbonate is dissolved.

U.S.P. 1900 p. 267

Liquor Magnesii Citratis
Solution of Magnesium Citrate

Magnesium carbonate..fifteen grammes.....15.0 gms.
Citric Acid.. three grammes.....33.0 "
Syrup of citric acid...sixty cubic centimeters.....66.0 cc.
Potassium bicarbonate..two and one-half grammes..... 2.5 gms.
Water a sufficient quantity

Dissolve the citric acid in one hundred and twenty cubic centimeters/ of water and having added the magnesium carbonate, stir until it/ is dissolved. Filter the solution into a strong bottle of the capacity/ of about three hundred and sixty cubic centimeters containing the syrup of citric acid. Then add enough water to nearly fill the bottle, drop/ in the potassium bicarbonate, and immediately stopper the bottle/ securely. Lastly, shake the mixture occassionally, until the potassium/ bicarbonate is dissolved. This solution should be freshly prepared/ when wanted.
Average dose - 360 cc (12 fluidounces.)

U.S.P. 1910 p. 248

Liquor Magnesii Citratis
Solution of Magnesium Citrate
Liquor mag. cit.

One hundred mils of the Solution contains magnesium citrate corre/sponding to not less than 1.5 gm. of mag-

nesium oxide (MgO=40.32)./

Magnesium Carbonate, fifteen grammes.....15.0 gms.
Citric Acid, thirty-three grammes.....33.0 gms.
Syrup, sixty milliliters.....60.0 mills.
Purified Talc, five grammes..... 5.0 gms.
Oil of Lemon, one-tenth of milliliter... 0.1 mill.
Potassium Bicarbonate, two and five tenth grammes.....2.5 gms.
Water, a sufficient quantity.

Dissolve the citric acid in one hundred and fifty mils of hot water in a/ suitable dish, and, having added the magnesium carbonate, previously/ mixed with one hundred mils of water, stir until it is dissolved. Then/ add the syrup, heat the mixed liquids to the boiling point, immediately/ introduce the oil of lemon, previously triturated with the purified talc,/ and filter the mixture, while hot, into a strong bottle (previously rinsed/ with boiling water) of suitable capacity. Introduce enough boiling water/ to make the product measure..three hundred and fifty mils. Stopper it/ with purified cotton until cold, then drop in the potassium bicarbonate,/ and immediately stopper the bottle securely. Lastly, shake the solution occassionally until the potassium bicarbonate is dissolved. Keep the bottle on its side in a cool place/ preferably in a refrigerator./

Note.- In this process the 2.5 gms. of potassium bicarbonate may be/ replaced by 2.1 gm. of sodium bicarbonate, preferably in tablet form.

Add 1 mill of glacial acetic acid and 3 mils of an aqueous solution of potassium/ acetate (1 in2) to 10 mils of Solution of Magnesium Citrate. Shake the mixture/ vigorously, then gently rub the sides of the test tube with a glass rod for a few/ minutes and allow to stand for one hour; no white crystalline precipitate, soluble/ in ammonia water is produced(tartaric acid)./

Dilute 2 mils of the Solution with 8 mils of distilled water and add 5 drops of/ hydrochloric acid and 1 mil of barium chloride T.S./ no turbidity is produced/ within one minute (sulphate).

Dilute 2 mils of Solution with 8 mils of distilled water and add 5 mils of/ ammonium oxalate T.S.; not more than a slight turbidity is produced (calcium).

Assay.- Transfer 10 mils of Solution of Magnesium

1910 U.S.P. (Continued)

Citrate, accurately/ measured to a platinum or porcelain dish, evaporate to dryness, and ignite until/ not of the carbonaceous matter has burned off. Add to the residue 20 mils of/ dilute hydrochloric acid, heat on a water bath for fifteen minutes, filter it/ necessary, and wash the residue thoroughly with hot water. To the combined/ filtrate and washings, which should measure about 100 mils, add a excess of/ sodium phosphate T.S.(about 20 mils), then add ammonia water gradually,/ with constant stirring, until slightly alkaline, allow to stand for ten minutes, add/ 30 mils of ammonia water, and allow to stand for twelve hours. Collect the precip-/itate on a filter, wash it with dilute ammonia water(1 volume ammonia water/ to 3 volumes of water) until 10 mils of the wahing, when acidulated with nitric acid yield not more than an opalescense on the addition of a few drops of silver/ nitrate T.S. Dry and ignite to constant weight. The weight of the magnesium/ pyrophosphate so obtained is not less than 0.414 gm, indicating an equivalent/ of not less than 1.5 gm. of magnesium oxide in 100 mils of the solution.

Average dose - Metric, 300 mils, Apothecaries 12 fluidounces.

U.S.P. 1920 p. 218.

Liquor Magnesii Citratis
Solution of Magnesium Citrate
Liq. Mag. Cit.

Solution of Magnesium Citrate contains, in each 100 cc; magnesium/ citrate corresponding to not less than 1.5 gms. of Mg O.

Magnesium Carbonate	15.0 gms.
Citric Acid	35.0 gms.
Syrup	60.0 gms.
Purified Talc	5.0 gms.
Oil of Lemon	0.1 cc.
Potassium Bicarbonate	2.5 gms.
Distilled water, a sufficient quantity to make	350.00cc.

Dissolve the citric acid in 150 cc. of hot distilled water in a suitable/ dish, and, having added the magnesium carbonate previously mixed with/ 100 cc. of distilled water, stir until it is dissolved. Then add the syrup,/ heat the mixed liquids to the boiling points, immediately

U.S.P. 1920 (continued)

introduce the oil/ of lemon, previously triturated with the purified talc, and filter the mix/ture, while hot, into a strong bottle(previously rinsed with boiling water)/ of suitable capacity. Add enough boiled distilled water to make the/ product measure 350 cc. Stopper the bottle with purified cotton, allow/ to cool, drop in the potassium bicarbonate, and immediately stopper/ the bottle securely. Lastly, shake the solution occassionally until the/ potassium bicarbonate is dissolved. Keep the bottle on its side in a/ cool place preferably a refrigerator.

Note.- In this process the 2.5 gm. of potassium bicarbonate may be/ replaced by 2.1 gm. of sodium bicarbonate, preferably in tablet form.

Description and physical properties - A slightly yellow clear, effervescent liquid,/ having a sweet, acidulous taste and a lemon flavor.

Tests for Purity - Add 1 cc of glacial acetic acid and 3 cc. of an aqueous solu/tion of potassium acetate (1 in 2) to 10 cc. of Solution of Magnesium Citrate,/shake the mixture vigorously, then gently rub the sides of the test tube with a glass rod for a few minutes, and allow to stand for one hour; no white crystal/line precipitate soluble in ammonia T.S. is produced (tartaric acid).

Dilute 2 cc. of the Solution with 8 xx. of distilled water, and add 5 drops of/ hydrochloric acid and 1 cc. of barium chloride T.S.; no turbidity is produced/ within one minute (sulphate).

Dilute 2 cc. of Solution with distilled water to 45 cc., and add 5 cc. of am/monium oxalate T.S. and mix well: the resulting turbidity, if any, is not greater than the turbidity in a control test made with 1 cc. of a Solution pre/pared as follows: Dissolve 1 gm. of calcium carbonate, previously dried to/ a constant weight at 200° C. in 1 cc. of acetic acid and 5 cc. of distilled water. Boil for about one minute, and dilute with distilled water to 100 cc. (calcium).

Boil down exactly 10 cc. of the solution to about 5 cc. to expel carbon dioxide, dilute with 15 cc. of distilled water, and titrate with half-normal sodium/ hydroxide, using phenolphthalein T.S. as indicator: it requires not less than 9.5 cc. of the alkali for neutra-

U.S.P. 1920 (Continued)

lization (minimum of acidity). Concentrate/ the liquid, and transfer it completely with the acid of a little distilled water to a/ platium or porcelain crucible, evaporate to dryness, and proceed as directed/ under the assay for alkali salts of organic acids, page 431: not less than 28 cc. of half-normal sulphuric acid should be consumed, (minimum of total citric acid.)

Assay for Magnesium Oxide - Measure exactly 10 cc. of the solution of Magnesium/ citrate, transfer to a platinum or porcelain dish, evaporate to dryness, and/ ignite most of the carbonaceous matter has burned off. Add to the residue/ 20 cc. of diluted hydrochloric acid, heat on a water bath for fifteen minutes, filter if necessary, and wash the residue thoroughly with hot distilled water./ To the combined filtrate and washings which should measure about 100 cc.,/ add an excess of sodium phosphate T.S. (about 20 Cc.0 then gradually add/ ammonia T.S with constant stirring until slightly alkaline. After ten minutes/ add 30 cc. of ammonia T.S. and allow the mixture to stand for twelve hours./ Then filter ans wash the precipitate with a mixture of/ volume of ammonia/ T.S. to 19 volumes of distilled water until free from chloride. Dry and ignite to constant weith. The weight of the magnesium pyrophosphate ($Mg_2P_2O_7$)/ so obtained is not less than 0.414 gm. indicating an equivalent of not less/ than 1.5 gm. of MgO in 100 cc. of the Solution.

Average Dose - Metric 350 cc. - Apothecaries, 12 fluidounces.

U.S.P. 1930

p. 214.

Liquor Magnesii Citratis.
Solution of Magnesium Citrate
Liqu. Mag. Cit.

Solution of Magnesium citrate contains, in each 100 cc. an amount/ of magnesium citrate corresponding to not less than 1.6 gm. and not/ more than 1.9 gm. of Mg O./

Magnesium Carbonate	15 gm.
Citric Acid	33 gms.
Syrup	60 cc.
Purified Talc	5 gm.
Oil of Lemon	0.1 cc.
Potassium Bicarbonate	2.5 gm.
Siarillws	

Distilled water, a sufficient quantity, to make.....350 cc.

Dissolve the citric acid in 150 cc. of hot distilled water in a suit/able dish, and having added the magnesium carbonate, previously/ mixed with 100 cc. of distilled water, stir until it is dissolved. Then/ add the syrup, heat the mixed liquids to the boiling point, immediately/ add the oil of lemon, previously triturated with the purified talc, and/ filter the mixture, while hot, into a strong bottle (previously rinsed/ with boiling distilled water) of suitable capacity. Add enough boiled/ distilled water to make the product measure 350 cc. Stopper the bottle/ with purified cotton, allow to cool, drop inthe potassium bicarbonate/ and immediately stopper the bottle securely. Lastly shake the solu/tion occassionally until the potassium bicarbonate is dissolved. Keep/ the bottle on its side in a cool place, preferably in a refrigerator./

Note.- In this process the 2.5 gm. of potassium bicarbonate may be/ replaced by 2.1 gm. of sodium bicarbonate, preferably in tablet form/ and, in addition, the solution may be carbonated by the use of CO_2/ under Pressure.

The stability of Solution of Magnesium Citrate is improved by ad-/justing the quantity of magnesium carbonate for each 350 cc. of Solution/ so that it corresponds to 6.0 gm. of MgO and by sterilizing the Solution/ after it has been bottled.

Description and physical properties.- A slightly yellow, clear effervescent liquid,/ having a sweet, acidulous taste and a lemon flavor/.

Tests for Identity.- Solution of Magnesium citrate responds to the tests for/ magnesium page 451.

To 5 cc. of Solution of Magnesium Citrate add 1cc. of potassium per-./manganate T.S. and 5 cc. of mercuric sulfate T.S. and heat the solution:/ a white precipitate is formed. Tests for purity.- Add 1 cc of glacial acetic acid and 3 cc. of an aqueous soltuion/ of potassium acetate (1 in 2) to 10 cc. of solution of Magnesium Citrate,/ shake the mixture vigorously, then gently rub the sides of the test tube/ with a glass rod for a few minutes, and allow to stand for one hour: no white,/ crystalline precipitate soluble in ammonia T.S. is produced (tartaric Acid).

Summary of U.S.P. and N.F. Data of Liquor Magnesii Citratis

Where and When official:-
U.S.P. 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930.

Official Latin title:-
Liquor Magnesiae Citratis 1850-'60
Liquor Magnesii Citratis 1870-'80 - '90, 1900, '10, '20, '30.

Official English title:-
Solution of citrate of Magnesia - 1850
Solution of citrate of Magnesium 1860, '70, '80, '90, 1900, '10, '20, '30.

Official Abbreviation:-
Liq. Mag. Cit. 1910, '20, '30.

Official Synonym:-

Official description:-

Official Assay:-

U.S.P. 1910-

One hundred mils of the solution contains/ magnesium citrate corresponding to not less than 1.5/ gm. of magnesium oxide (MgO = 40.32)./

U.S.P. 1920-

Solution of magnesium citrate contains in each 100 cc. magnesium/ citrate corresponding to not less than 1.5 gm. of MgO.

U.S.P. 1930-

Solution of Magnesium citrate contains, in each 100 cc an amount/ of magnesium citrate corresponding to not less than 1.6 gm. and not/ more than 1.9 gm. of MgO.

Official Preparation:-

Official dose:-

1900 - 360 cc. (12 fluidounces)
1910 - 350 mils - Apothecaries 12 fluidounces
1920 - 350 cc. - " " "
1930 - Metric 200 cc. - Apothecaries 7 fluidounces.

Approved by W O Richtmann
Professor of Pharmacognosy

Date June 4, 1940