

BIBLIOGRAPHY
OF
SOLUTION OF AMMONIUM ACETATE
BY
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INTRODUCTION.

The history of Solution of Ammonium Acetate, known by the synonym Spirit of Mindererus, has been one of disputed claims from the 17th century up to the present day. There is still no definite proof as to the exact discoverer of the preparation, for many authors give the credit to Raymund Minderer, a Scottish physician, and others to Hermann Boerhaave, a German.

In the literature compiled in this thesis, there are twenty-two references (1) stating Minderer as the discoverer, and sixteen (2) giving Boerhaave the credit of the preparation. There are three conflicting trends of thought concerning the Solution of Ammonium Acetate, one of which states that Raymund Minderer, a physician of Augsburg, prepared the Solution of Ammonium Acetate in 1621, and that it was made by saturating strong vinegar with spirit of hartshorn.(3) Other authors contend that Hermann Boerhaave first prepared the solution (4), and a third school of thought believes the preparation to have been prepared by Boerhaave but greatly

(1). The authorities upholding this belief will be found on a separate sheet following the introduction.

(2). The authorities upholding this belief will be found on a separate sheet following the introduction.

(3). Atkinson, R.M., Pharm. Jour., S.2, 5, p. 462, 1864.

(4). Pideritii, P.J., Pharmacia Rationalis, 3 ed., p. 363, 1791.

publicized by Minderer in Scotland, and, though not originally prepared by him, came to be called Spirit of Mindererus because of his great use of it. The latter contention was upheld by six references in the literature. (5).

In studying this problem of the Solution of Ammonium Acetate, I found just one reference which conveyed information entirely different from the three beliefs stated above, saying that although some historians in medicine believe the present day Spirit of Mindererus to be the same as the preparation of Minderer, it is not, due to the fact that there is nothing in the Augsburg Pharmacopœias, which are designated as the "Pharmacopœias of Minderer", about ammonium acetate, and that a Spiritus Mindereri is first found in the Mantissa hermetica in the 1643 edition of the Augustana, and remained until the last edition in 1734. However, this Spiritus Mindereri had nothing to do with ammonium acetate, but was a distillate of a number of plant drugs as listed in the reference, and the original Spiritus Mindereri had to yield its name to a very different preparation of Minderer, the Aqua acovistica, which was introduced into the Augsburg Pharmacopœias in 1643. (6).

Although I have found a majority of references giving the credit of the discovery of Solution of Ammonium Acetate to Raymond Minderer, no definite conclusion that he is the discov-

(5). The authorities upholding this belief will be found on a separate sheet following the introduction.

(6). Husemann, T., Pharm. Zeit., 44, p. 702, 1899.

erer can be drawn, due to the conflicting claims crediting Hermann Boerhaave with the preparation and giving Minderer minor recognition.

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ed., p. 640, 1847.
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1879.
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p. 90, 1891.
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p. 38, 1897.
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- (2). Pideritii, P.J., Pharmacia Rationalis, 3 ed., p. 363, 1791.
(Gottling, S.), Alman. o. Taschenb., 22, p. 9, 1802.
Trommsdorff, J.B., Apothekerkunst, v.1, p. 872, 1805.
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Bucholz, C.F., Theorie u. Prax., 2 ed., v.2, p. 88, 1818.
Geiger, P.L., Handb. d. Pharmacie, 1 ed., p. 623, 1824.
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2, p. 212, 1884.

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1674.

Minderer (Raimond).

Biog. Univers., supp., 74, p. 109.

Gives a history of Minderer's life and states that he had the reputation of first making Esprit de Mindererus.

Boerhaave, H.

1732.

Spiritus Ammoniae Acetatis.

Elemen. Chem., Eng. transl., v.2, p. 338-9.

Gives the properties, method of preparation and uses of Solution of Ammonium Acetate.

Boerhaave, H.

1735.

A Salt Spirit from Spirit of Sal Ammoniac and Spirit of Vinegar.

Elemen. Chem., Eng. transl., v.1, p. 88.

Gives a method of preparation and uses of Solution of Ammonium Acetate.

(Committee.)

1735.

Spiritus Mindereri.

Pharmaco. Coll. Regii Medicor. Edinburg., 2 ed., p. 167.

Gives a method of preparation of Solution of Ammonium Acetate.

Shaw, P.

1740.

Spiritus Mindereri.

Dispens. Royal Coll. Physicians in Edinburg., 4 ed., p. 214.

Gives the formula of the Edinburgh Pharmacopoeia for Solution of Ammonium Acetate.

James, R.

1747.

Spiritus Mindereri.

Univers. Eng. Dispens., 1 ed., p. 654.

Gives the official Latinized title, method of preparation, uses and general history of Solution of Ammonium Acetate.

Lewis, W.

1748.

Spiritus Mindereri.

Pharmaco. Royal Coll. Physicians in Edinburg., transl. from the 4 ed., p. 272.

Gives directions for the preparation of Solution of Ammonium Acetate and notes that the directions were changed from those of the previous Dispensatory.

Brookes, R.

1753.

Spiritus Mindereri.

Gen. Dispens., 1 ed., p. 340.

Gives the official Latin and English titles, method of preparation, dose and uses.

(Committee.)

1756.

Spiritus Mindereri.

Pharmaco. Coll. Regii Medicor. Edinburg., --ed., p. 172.

Gives a method of preparing Solution of Ammonium Acetate.

Lewis, W.

1761.

Spiritus Mindereri.

Experimental Hist. Mat. Med., 1 ed., p. 17.

Gives the official Latin title, uses, dose and methods of preparing Solution of Ammonium Acetate.

Baume, A.

1773.

(Vom essigsauern Ammonium.)

Elemens d. Pharm., v.2, p. 61. (Buchholz, Theorie u. Prax., 2 ed., v.2, p. 88.)

(Gives a history of Solution of Ammonium Acetate with references.)

(Committee.)

1774.

Spiritus Mindereri.

Pharmacö. Coll. Regii Medicor. Edinburg., --ed., p. 116.

Gives a method used in the preparation of Solution of Ammonium Acetate.

(Committee.)

1777.

Spiritus Mindereri.

Dispens. Pharmaceu. Brunsvicense, --ed., p. 334.

Gives a method of preparing Solution of Ammonium Acetate.

Wenzel, C.F.

1777.

(Vom essigsauern Ammoniak.)

Lehre. v. Verwandtschaft d. Korper, 1 ed., p. 454. (Buchholz, Theorie u. Prax., 2 ed., v.2, p. 88.)

(Gives a history of Solution of Ammonium Acetate with

references.

Gmelin, J.F.

1781.

Minderer's Geist.

Einleitung in d. Pharm., 1 ed., p. 132.

Gives methods of preparing Solution of Ammonium Acetate.

Leonhardi, ---.

1782.

(Vom essigsauern Ammoniak.)

D. Schweidisch. Apothk., 2 ed., p. 63. (Buchholz, Theorie u. Prax., 2 ed., v.2, p. 88.)

(Gives a history of Solution of Ammonium Acetate with references.)

Quincy, J.

1782.

Spiritus Mindereri.

Pharm. Off. & Extemp., 15 ed., p. 287.

Gives Latin and English titles, method of preparation, uses and doses of Solution of Ammonium Acetate.

Pfingsten, J.H.

1783.

Spiritus Mindereri.

Deutsch. Dispens., --ed., p. 779.

Gives synonyms, method of preparation and comments on Solution of Ammonium Acetate.

Spielmann, J.R.

1783.

Spiritus Mindereri.

Pharmaco. Generalis, 1 ed., Pt. 2, p. 309.

Gives the title of Solution of Ammonium Acetate only.

Tielebein,---.

1784.

Minderer's Geist.

Alman. o. Taschenb., 5, p. 44.

Gives a method of preparing Solution of Ammonium Acetate.

Lewis, W.

1785.

Spiritus Mindereri.

New Dispens., 5 ed., p. 472.

Gives the official Latin and English titles, method of preparation, dose and uses.

Lowe,---.

(1785.)

(Vom essigsauern Ammonium.)

Crell's Chem. Annal., 2, p. 509. (Alman. o. Taschenb., --, p.6; Bucholz, Theorie u. Prax., 2 ed., v.2, p. 88.)

(Discusses the association of this preparation with Minderer and gives methods of preparation.)

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(1785.)

Minderer's Geist und Hornbley durch ein gegenseitige
Verwandschaft.

Alman. o. Taschenb., fur 1784, p. 44.

Gives a method of preparing Solution of Ammonium Acetate.

Hagen, K.G.

1786.

Minderer's Geist oder Essigsalmiak.

Lehrb. d. Apotheker., 3 ed., p. 675.

Gives synonyms and a brief history of the Solution of Ammonium Acetate in connection with Minderer.

Gottling, J.

1787.

(Mindererischen Geistes.)

Alman. o. Taschenb., 8, p. 129, f.n. (Bucholz, Theorie u. Prax., 2 ed., v.2, p. 88.)

Discusses the association of this Solution of Ammonium Acetate with R. Minderer and gives methods of preparation.

Hoffmann,----.

1787.

Pharmaceutisch-chemische Bemerkungen.

Alman. o. Taschenb., 8, p. 124. (Bucholz, Theorie u. Prax., 2 ed., v.2, p. 88.)

Discusses Solution of Ammonium Acetate, especially as to methods of preparation.

Remler,----.

1787.

(Pharmaceutisch-chemische Bemerkungen.)

Alman. o. Taschenb., 8, p. 129. (Bucholz, Theorie u. Prax., 2 ed., v.2, p. 88.)

Discusses the preparation of Solution of Ammonium Acetate.

Wiegleb, J.C.

1790.

(Vom essigsauern Ammonium.)

Geschichte d. Chemie, v.1, Pt.1, p. 197. (Bucholz, Theorie u. Prax., 2 ed., v.2, p. 88.)

(Gives a history of Solution of Ammonium Acetate with references.)

Duncan, A.

1791.

Aqua Ammoniae Acetatae.

Edinburgh New Dispens., 3 ed., p. 399.

Gives the Latin and English titles, method of preparation and uses of Solution of Ammonium Acetate.

Pideritii, P.J.

1791.

Spiritus Mindereri.

Pharmacia Rationalis, 3 ed., p. 363.

Gives the formula and comments on Solution of Ammonium Acetate, stating that it was first prepared by Boerhaave.

Gmelin, J.F.

1792.

Minderer's Geist.

Grundriss d. Pharm., 1 ed., p. 186.

Gives the official Latin title and method of preparing Solution of Ammonium Acetate.

Hahnemann, S.

1793.

Essigsalmiak.

Apothekerlerikon, 1 ed., p. 271. (Bucholz, Theorie u. Prax., 2 ed., v.2, p. 88.)

Gives a history of the Solution of Ammonium Acetate and a description of its characteristic properties.

(Rotheram, J.)

1794.

Aqua Ammoniae Acetatae.

Edinburg. New Dispens., 4 ed., p. 360.

Gives formulas of the Edinburgh and London Pharmacopoeias

for Solution of Ammonium Acetate and states that "though this article has long been known by the name of Spiritus Mindereri, so called by the inventor, yet the name used by both colleges is undoubtedly preferable, as giving a proper idea of its constituent parts".

Wiegleb, J.C.

1796.

Minderer's Liquor.

Handb. d. allgemein. Chemie, 3 ed., v.2, p. 167.

Discusses the various known methods of preparing Solution of Ammonium Acetate and states that this preparation is better known as Minderers Liquor.

Gmelin, J.F.

1797.

(Mindererus' Spirit.)

Geschichte d. Chemie, v.1, p. 67.

States that Gilbert in England had written about a preparation which a doctor had prescribed that was similar to the Solution of Ammonium Acetate which had been named Minderer's Spirit after Minderer.

Gmelin, J.F.

1797.

Spiritus Mindereri.

Geschichte d. Chemie, v.1, p. 570.

States that the Solution of Ammonium Acetate was named after Raymond Minderer, a physician, and it was called Spirit of Mindererus.

Piepenbring, H.D.

1797.

Mindererischen Geistes.

Trommsdorff's Jour. d. Pharm., 4, p. 112. (Deutsch. Apothekerb., 2 ed., p. 1167.)

Discusses the preparation of Solution of Ammonium Acetate.

Plenck, J.J.

1798.

Spiritus Mindereri.

Pharmacologia Chirurgica, --ed., p. 156.

Gives the Spanish name, properties, method of preparation and uses of Solution of Ammonium Acetate.

Heim,---

1799.

Spiritus Mindereri.

Pharm. Borussica, 1 ed., p. 25. (Buchholz, Theorie u. Prax., 2 ed., v.2, p. 88.)

Gives the old and new Latin titles and a chemical symbol of Solution of Ammonium Acetate.

Herbststadt, S.F.

1799.

De Minderersche Geest.

Catechismus d. Apothecarsk., 1 ed., p. 194.

Discusses Solution of Ammonium Acetate, giving a synonym.

Duncan, A. Jun.

18--?

Aqua Acetitis Ammoniae.

Edinburg. New Dispens., 3 ed., p. 450; *ibid.*, 4 ed., p. 476; *ibid.*, 6 ed., p. 505; *ibid.*, 7 ed., p. 370.

Gives the Latin and English titles of the 2 British Pharmacopoeias, synonyms, method of preparation and medicinal uses of Solution of Ammonium Acetate.

(Gottling, S.)

1802.

(Minderer's Spirit.)

Alman. o. Taschenb., 22, p. 9. (Berlinisches Jahrb., f.d., Pharm., 8, p. 158.)

States that in 1732 Boerhaave first prepared the Solution of Ammonium Acetate, which afterwards was known as the Spirit of Mindererus.

Dorffurt, A.F.

1804.

Liquor Ammonii Acetici.

Deutsch. Apothekerb., 2 ed., p. 1158.

Gives the official Latin and German titles, synonyms, method of preparation and history of Solution of Ammonium Acetate.

Durande, ---.

1804.

(Liquor Ammonii Acetici.)

(Morveau's Anfangsg. d. Chem., 3, p. 13.) (Dorffurt, Deutsch. Apothekerb., 2 ed., p. 1165.)

(Gives the official Latin and German titles, synonyms, method of preparation and history of Solution of Ammonium Acetate.)

Scheffer, H.P.

1804.

(Liquor Ammonii Acetici.)

Chem. Vorles., 1 ed., p. 136. (Dorffurt, Deutsch. Apothekerb., 2 ed., p. 1165.)

(Gives the official Latin and German titles, synonyms, method of preparation and history of Solution of Ammonium Acetate.)

(Duncan, A. Jun.) 1805.

Aqua Ammoniae Acetitis.

Edinburg. New Dispens., 1 ed., (Worcester ed.), p. 408.

Gives the Latin and English titles, synonyms and method of preparing Solution of Ammonium Acetate.

Kraus, L. A. 1805.

Liquor Ammonii Aceti.

Preussische Pharmak., 4 ed., p. 133.

Gives 83 synonyms and methods of preparing Solution of Ammonium Acetate.

Trommsdorff, J. B. 1805.

Essigsaures Ammoniak.

Apothekerkunst, v.1, p. 872.

Gives a method of preparation for Solution of Ammonium Acetate and states that there are two preparations which are very similar, one of which was discovered by Herrmann Borhave, and the other by Doctor Minderer.

Coxe, J. R. 1806.

Aqua Ammoniae Acetitis.

Am. Dispens., 1 ed., p. 135; *ibid.*, 4 ed., p. 49.

Gives the official Latin and English titles, synonyms, method of preparation and medical use of Solution of Ammonium Acetate.

Bucholz, C.F.

1807.

Spiritus Mindererus.

Alman. o. Taschenb., 28, p. opp. Junius.

States that in 1732 Boerhaave discovered the Solution of Ammonium Acetate which was named Spirit of Mindererus after Minderer, a physician in Scotland.

Juch, C.W.

1808.

Liquor Ammonii Acetici.

Pharmaco. Borussica o. Preussische Pharmak., 2 ed., p. 266; ibid., 3 ed., p. 287.

Gives synonyms, a description and a method of preparation of Solution of Ammonium Acetate.

Thacher, J.

1810.

Aqua Acetitis Ammoniae.

Am. New Dispens., 1 ed., p. 265; ibid., 2 ed., p. 409; ibid., 4 ed., p. 454.

Gives the Latin and English titles, official synonym, methods of preparation and uses of Solution of Ammonium Acetate.

Brugnatelli, L.V.

1811.

Acetate d. Ammoniaque.

Pharmacopée Generale, v.1, p. 83.

Gives a method of preparation, synonyms, uses dose and

names of several people who have worked with the Solution of Ammonium Acetate.

Schaacke, ---.

1811.

Liquor Mindereri.)

Berliner Jahrb., 1, p. 119. (Arch. d. Pharm., 80, p. 33.)

(Discusses methods of making Solution of Ammonium Acetate.)

Virey, J.J.

1811.

L'Esprit de Mindererus.

Traite d. Pharm. Theor. e. Prat., 1 ed., v.2, p. 465; *ibid.*, 4 ed., v.2, p. 446.

Gives a method of preparation for Solution of Ammonium Acetate and states that this medicine, which was first prepared by Minderer, has retained the name of Spirit of Mindererus.

(Buchholz, C.F.)

1812.

Ueber das Unbestimmte und Nachtheilige bey der gewöhnlichen Art der Bereitung des gewöhnlichen Liquor Ammonii Acetici.

Alman. o. Taschenb., 33, p. 159.

Comments on the process of the Pharmacopoeia Borussica, with experimental data, of preparing the Solution of Ammonium Acetate.

Destouches, ---.

1814.

Neues Verfahren das flussige essigsaurer Ammoniak (Min-

derers Geist) zu bereiten.

Trommsdorff's, Jour. d. Pharm., 23, Pt.1, p. 182.

Gives the properties and a method of preparation of Solution of Ammonium Acetate.

Bauys, M.

1816.

Sur la Preparation de l'Acide acetique, et de quelques Acetates officinaux.

Jour. D. Pharm., 2, p. 563.

States that many distinguished pharmacists have worked on the Solution of Ammonium Acetate, devising so many different methods of preparation that Mindererus would no longer recognize his preparation.

Juch, C.W.

1816.

Minderers Geist,

Handb, d. Pharmazie, 1 ed., p. 263.

Gives a method of preparation and synonyms of Solution of Ammonium Acetate.

Ewell, J.

1817.

Spirit of Mindererus.

Med. Companion, 3 ed., p. 643; *ibid.*, 7 ed., p. 808.

Gives a method of preparing Solution of Ammonium Acetate.

Bucholz, C.F.

1818.

Vom essigsauren Ammonium.

Theorie u. Prax., 2 ed., v.2, p. 88.

Gives many synonyms, a history of the Solution of Ammonium Acetate, in which is given all the credit for it to Boerhaave, stating that a Minderer merely sponsored its use in Scotland but did not originally prepare it. States that Baume proposed to concentrate the solution, and that many men after him did likewise, with references.

(Committee.)

1819.

Liquor Ammonii Acetici.

Pharmac. Hannoverana, --ed., p. 221; *ibid.*, --ed., p. 146.

Gives the official Latinized title, synonyms, method of preparation, uses and doses of the Solution of Ammonium Acetate.

Kerr, W.W.

1819.

Liquor Ammonii Acetatis.

Bull. Pharm., 13, p. 165.

Discusses the preparation of Solution of Ammonium Acetate.

Duncan, A. Jun.

1822.

Aqua Acetatis Ammoniae.

Edinburg. New Dispens., 10 ed., p. 374.

Gives the official Latin and English titles and methods of preparation of the 3 British Pharmacopoeias and the medical uses of Solution of Ammonium Acetate.

(Committee.)

1823.

Acetas Ammoniae Dilutus.

Baver. Pharmaco., --ed., Pt.2, p. 1.

Gives the Latin and German titles, a short history of the preparation, method of preparation and a caution for the storage of Solution of Ammonium Acetate.

Horst, J.J.

1823.

(Vom essigsauern ammoniak.)

Arch. d. Pharm., 4, p. 257. (Pharmaco. Borussica, 2 ed., p. 520.)

Discusses the Solution of Ammonium Acetate and gives a method of preparation.

Black, R.H.

1824.

Liquor Ammoniae Acetatis.

Pharmaceutical Guide, 2 ed., p. 97.

Gives a method of preparation for Solution of Ammonium Acetate.

Brandes, R.

1824.

Essigsaueres Ammoniak.

Archiv. d. Apotheker-vereins, 9, p. 136.

Discusses several methods of preparing the Solution of Ammonium Acetate and gives the properties of the solution.

Dingler, E.

1824.

Ueber Ammonium carbonicum und aceticum.

Magaz. f. Pharm., 8, p. 279.

Discusses the properties and preparation of Solution of Ammonium Acetate.

Geiger, P.L.

1824.

Liquor Ammoniaci Acetici.

Handb. d. Pharmacie, 1 ed., p. 623; *ibid.*, 2 ed., p. 720.

States that this solution was first prepared by Boerhaave in 1732 and that later Minderer, in Scotland, popularized it and it was given his name. Also discusses the preparation, properties and uses of Solution of Ammonium Acetate.

Brandes, R.

1825.

Liquor ammonii acetici.

Archiv. d. Apotheker-vereins, 11, p. 368.

Discusses the preparation, concentration and properties of Solution of Ammonium Acetate.

Brandes, R.

1825.

Liquor Ammonii Acetatis.

Archiv. d. Pharm., 13, p. 26.

Discusses Dingler's comments of Martius' report of the reactions of Solution of Ammonium Acetate.

Coxe, J.R.

1825.

Aqua Acetatis Ammoniae.

Am. Dispens., 6 ed., p. 53; *ibid.*, 7 ed., p. 53; *ibid.*, 8 ed., p. 54; *ibid.*, 9 ed., p. 57.

Gives the official Latin and English titles, method of preparation, incompatibilities and medical uses of the Solution of Ammonium Acetate.

Gempt, ---.

1825.

Liquor Ammonii Acetici.

Arch. d. Pharm., 11, p. 368.

Discusses methods of preparing a Solution of Ammonium Acetate.

Jeromel,---.

1825.

Essigsaures Ammoniak (flussiges.)

Archiv. d. Pharm., 13, p. 25.

Describes his method of preparing the Solution of Ammonium Acetate.

Maysuyer, M.

1825.

(Use of Minderer's Spirit.)

Jour. d. Chem. Med., 1, p. 549.

(Discusses a treatment in which Solution of Ammonium Acetate is used.)

Paris, J.A.

1825.

Acetate of Ammonia.

Elements of Med. Chem., Am. Ed., p. 404.

Gives a method of preparing the Solution of Ammonium Acetate.

Brande, W. P.

1826.

Liquor Ammoniae Acetatis.

Handb. d. Mat. Med. u. Pharm., (Germ. transl. from Engl., P. Wolff), 1 ed., p. 284.

Gives a formula for Solution of Ammonium Acetate and compares it with other preparations, and reports on com-

ments by Chaussier and uses by Thomsen, but gives no historical data.

Funcke, ---.

1826.

Liquor Ammonii Acetici.

Archiv. d. Pharm., 18, p. 163.

Gives a method of preparing the Solution of Ammonium Acetate.

Rademacher, C.

1826.

Ueber die Bereitung des Liquor Ammoniae Acetatis durch Ammoniakgas.

Archiv. d. Apotheker., 19, p. 265.

Discusses the preparation of Solution of Ammonium Acetate with ammonia gas.

Schmidt, J.

1826.

Pharmaceutische Erfahrungen.

Magaz. f. Pharm., 13, p. 66.

In discussing several discoveries, gives the Solution of Ammonium Acetate fourth and gives a method of preparation.

Thomson, A.T.

1826.

Liquor Ammoniae Acetatis.

Lond. Dispens., 4 ed., p. 672; *ibid.*, 10 ed., p. 884.

Gives the official Latin and English titles of several pharmacopoeias, methods of preparation of these pharmacopoeias, qualities, both physical and chemical, medical properties and uses of Solution of Ammonium Acetate.

(An American Physician.)

1827.

Liquor Ammoniae Acetatis.

Eclec. Gen. Dispens., 1 ed., p. 321.

Gives the official Latin and English titles of several pharmacopoeias, methods of preparation, synonyms, qualities, medical properties, uses and dose of Solution of Ammonium Acetate.

Bley, L.F.

1829.

Liquor Ammonii Acetici.

Handb. d. Pharmaceu. Prax., 1 ed., p. 173.

Gives the official Latin and German titles, synonyms, method of preparation and impurities which may be found in Solution of Ammonium Acetate.

(Committee.)

1829.

Alcali Ammoniacum Acetatum.

Pharmaco. Univer., 1 ed., p. 173; *ibid.*, 3 ed., p. 201; *ibid.*, 4 ed., p. 214.

Gives the official Latin titles of the pharmacopoeias in existence at that time, as well as the various methods of preparation official in those pharmacopoeias, and a brief history of the Solution of Ammonium Acetate.

Jourdan, A.J.L.

1829.

Spiritus Mindereri.

Pharmaco. Univer. (Germ. transl. from Fr.), 1 ed., v.1, p. 173.

Gives a synonym, methods of preparation and comments

on Solution of Ammonium Acetate, and states that Boerhaave is the originator of the solution.

(Jourdan, A.J.L.)

1829.

Alcali Ammoniacum Acetatum.

Pharmaco. Univer., (1 ed.), v.1, p. 173; *ibid.*, 2 ed., v.1, p. 185; *ibid.*, 3 ed., v.1, p. 201; *ibid.*, 4 ed., v.1, p. 214.

Gives synonyms, methods of preparation and comments on Solution of Ammonium Acetate, stating that Boerhaave was the first to prepare it and that it became a celebrated remedy.

Dulk, F.P.

1830.

Liquor Ammonii Acetici.

Pharm. Borussica, (Preussische Pharm.), 2 ed., p. 518; *ibid.*, 3 ed., p. 547; *ibid.*, 5 ed., p. 214.

Gives the official Latin and German titles, methods of preparation and history of Solution of Ammonium Acetate.

Juch, C.W.

1830.

Liquor Ammonii Acetici.

Pharmaco. Borussica o. Preussische Pharmak., 4 ed., p. 306.

A foot note states that though the Solution of Ammonium Acetate was used much by Minderer, still he was not the discoverer of it, but Boerhaave was.

Pfaff, C.H.

1831.

Liquor Ammonii Acetici.

Pharmaco. Slesvico-Holsatica, 1 ed., p. 276.

Gives synonyms, a method of preparation and properties

of Solution of Ammonium Acetate.

Murray, J.

1832.

Acetas Ammoniae. Acetate of Ammonia.

System of Mat. Med., 6 ed., p. 310.

States that the Solution of Ammonium Acetate had long been celebrated under the name of Spirit of Mindererus, and gives several uses of the solution.

Anthon, E.F.

1833.

Liquor Ammonii Acetici.

Handwörterb., 1 ed., p. 206.

- *Liquor acetatis ammoniaci.
- *Solutio acetitis ammoniaci.
- *Liquor alkali ammoniaci acetati.
- *Salsilago ammoniacalis.
- *Spiritus Mindereri.
- *Liquor Mindereri.
- *Liquor ophthalmicus Mindereri.
- *Mixture salina volatilis.
- *Acetas ammoniacae dilutus.
- *Acetas ammoniacae solutus.
- *Acetas ammoniacae aquosus.
- *Liquor alkali volatilis acetati.
- *Salsilago ammoniacalis acetosa.
- *Aqua ammoniae acetatae.
- *Liquor acetatus ammoniae.
- *Liquor acetatis ammoniaci.
- *Liquor acetitis ammoniacae.

- *Liquor ammoniaci acetosi.
- *Acetis ammoniae liquidus.
Sal ammoniacus liquidus.
Spiritus ophthalmicus Mindereri.
- *Sal Mindereri liquidus.
- *Ammonium aceticum liquidum.
- *Acetas ammoniae liquidus.
- *Acetas ammoniae solutus.
- *Acetas ammoniae dilutus.
- *Kali volatile acetatum liquidum.
- *Alkali volatile acetatum liquidum.
- *Ammonium subcarbonicum et acidum aceticum.
- *Acetum destillatum et ammoniacum subcarbonicum
- *Ammonium carbonicum et acetum destillatum.
- *Lösung des essigsäuren Ammoniaks.
- *Essigsäure Ammoniakflüssigkeit.
- *Essigsäure Ammoniumflüssigkeit.
- *Ammoniakacetatlösung.
- *Lösung des Ammoniakacetats.
- *Ammoniumessigflüssigkeit.
- *Ammoniakaleßsig.
- *Ammonisirter Essig.
- *Minderers Geist.
- *Minderers Spiritus.
- *Essigsalmiakflüssigkeit.
- *Flüssiges essigsäures Ammonium.
- *Minderers flüssiger Salmiak.
- *Flüssiger Salmiak.

- *Flussiger Essigsalmiak.
- *Fluchtige Salzmixtur.
- *Acetite ammoniacal liquide.
- *Acetite d'ammoniaque liquide.
- *Acete ammoniacal.
- *Vinaigre ammoniacal.
- *Esprit de Mindererus.
- *Liquor de Mindererus.
- *Eau ammoniacale acetique.
- *Ammoniaque aceteux liquide.
- *Liqueur d'acetit ammoniacal.
- *Acetate d'ammoniaque liquide.
- *Acetate ammoniacal liquide.

(Committee.)

1833.

Liquor Ammonii Acetici.

Pharmaco. Hannoverana, Nova, 1 ed., p. 237.

Gives the official Latinized title, synonym, method of preparation, uses and dose of the Solution of Ammonium Acetate.

Meyer, C.J.

1834.

Spiritus Mindereri.

Handb. d. Pharmakolog., 1 ed., p. 237.

Gives the Latin and English titles, synonyms, method of preparation and uses of the Solution of Ammonium Acetate.

Wood, G.B. & Bache, F.

1834.

Liquor Ammoniae Acetatis.

Dispens. U.S.A., 2 ed., p. 764; *ibid.*, 3 ed., p. 746; *ibid.*, 4 ed., p. 787; *ibid.*, 5 ed., p. 831; *ibid.*, 6 ed., p. 831; *ibid.*, 7 ed., p. 831; *ibid.*, 8 ed., p. 831; *ibid.*, 9 ed., p. 861; *ibid.*, 10 ed., p. 861; *ibid.*, 11 ed., p. 907.

Gives the official Latin titles and official English titles, methods of preparation of four pharmacopoeias, and discusses the several methods of preparation, its physical properties, medical properties and uses of Solution of Ammonium Acetate.

(Auctoritate Collegii Sanitatis.) 1835.

Liquor Ammonii acetic.

Cod. Medica. Hamburg., --ed., p. 138; *ibid.*, --ed., (1852), p. 188.

Gives the Latin title, method of preparation and qualities of Solution of Ammonium Acetate.

Geiseler, --v. 1837.

Ueber die Bereitung des Liquor Ammonii Acetici.

Archiv. d. Pharm., 61, p. 240.

Discusses methods of preparing Solution of Ammonium Acetate.

Mohr, C. 1839.

Pharmaceutisch-chemische Untersuchung ueber den Liquor Ammonii Acetici, in Bezug auf dessen verschiedene Mischung nach den angezeichneten europäischen Pharmakopoen.

Archiv. d. Pharm., 70, p. 189.

Gives a detailed discussion of the processes of preparing Solution of Ammonium Acetate and the reagents used, according to the several European Pharmacopoeias.

Jourdan, A.J.L.

1840.

Acetate d'ammoniaque.

Pharmaco. Univer., 2 ed., v.1, p. 219.

Gives the synonyms and comments concerning the Solution of Ammonium Acetate, stating that Boerhaave was the first to be associated with the solution.

du Menil, H.

1842.

Ueber aus Bleioxydacetat bereitetes Ammoniakacetat (Liquor Mindereri.)

Archiv. d. Pharm., 80, p. 33. (Jahrb. d. Pharm., 2, p. 394.)

Discusses methods of making Solution of Ammonium Acetate and says that Minderer was not the first to know this compound, but that Boerhaave knew of it and mentioned it in his book.

Duflos, A.

1843.

Spiritus Mindereri.

Theorie u. Prax. d. Pharm. Experiment. Chem., 2 ed., v.1, p. 163.

Gives synonyms and methods of preparation of Solution of Ammonium Acetate, but no historical data.

Pereira, J.

1843.

Liquor Ammoniae acetatis.

Elements of Mat. Med., Am. ed. from 2 Lond. ed., v.1, p. 293.

Gives a history of Solution of Ammonium Acetate, stating that it was first described by Boerhaave in 1732 and subsequently used by Minderer, and hence obtained on of its names, spiritus or Liquor Mindererus. Also gives methods of preparation, characteristics, impurities, physiological effects and uses of the solution.

An American Physician. 1844.

Liquor Ammoniae Acetatis.

Prescriber's Pharmaco., 3 ed., p. 49.

Gives the official Latin title, method of compounding, dose, incompatibilities and uses of Solution of Ammonium Acetate.

Marquart, C. 1844.

Essigsaures Ammoniak.

Lehrb. d, Pharm., 1 ed., p. 489.

Gives synonyms of Solution of Ammonium Acetate and states that Boerhaave discovered the preparation in 1732.

Geiger, P.L. & Mohr, C.F. 1845.

Spiritus Mindereri.

Pharmaco. Univer., Pt. 1, p. 756.

Gives a synonym, formula and data from various Pharmacopoeias about Solution of Ammonium Acetate.

Dobereiner, F. 1847.

Spiritus Mindereri.

Deutsch. Apothekerb., 3 ed., p. 1322.

States that Boerhaave first discovered the Solution of Ammonium Acetate, Gives a method of preparation, and discusses the properties of the solution.

Guibourt, N.J.

1847.

Acetate D'Ammoniaque Liquide.

Pharmaco. Raisonnee o. Traite d. Pharm., 3 ed., p. 665.

Gives a method of preparation and synonyms of the Solution of Ammonium Acetate.

Redwood, T.

1847.

Liquor Ammoniae Acetatis.

Gray's Supp. to the (Lond.) Pharmaco., (rev. ed.), p. 640.

States that the Solution of Ammonium Acetate has long been used in medicine and that it was introduced in the early part of the 17th century by Mindererus, and therefore was called Mindererus's spirit. Gives a method of preparation of the Solution of Ammonium Acetate.

Dobereiner, F.

1848.

Essigsures Ammoniumornd.

Grundriss d. Pharm., 1 ed., p. 410.

States that Boerhaave discovered the Solution of Ammonium Acetate and a Minderer publicized it, and gives a method of preparation and properties of the solution.

Mohr, F.

1850.

Liquor Ammoniaci Acetici.

Commentar. z. Preussischen Pharmaco., v.2, p. 75.

Gives a method of preparation and comments on the Solution of Ammonium Acetate.

King, J. & Newton, J.S. 1852.

Ammoniae Acetatis Aqua.

Eclectic Dispens. U.S.A., 1 ed., p. 58.

Gives the official Latin and official English titles, the preparation, history, properties, uses and an official preparation in which the Solution of Ammonium Acetate is used.

(Landerer, ---.) (1854.)

(Liquor Ammonii Acetici.)

Oest. Zeit. f. Pharm., 8, p. 218. (Jahrb. d. Pharm., 14, p. I 99.)

(Discusses the materials used in making the Solution of Ammonium Acetate.)

Phillippe, A. 1855.

Raymond Minderer.

Geschicht. d. Apothek., Germ. transl., H. Luding, p. 482.

States that the Solution of Ammonium Acetate was named "Spiritus Mindereri or Liquor Mindereri" after Raymond Minderer.

Parrish, E. 1856.

Liquor Ammoniae Acetatis.

Prac. Pharm., 1 ed., p. 348.

Gives synonyms, methods of preparation and the dose of

Solution of Ammonium Acetate.

Hager, H.

1857.

Liquor Ammonii aceticici.

Neue. Pharmak. Norddeut schl., 1 ed., p. 224.

Gives the official Latinized titles of several German Pharmacopoeias, methods of preparation, definition, history and properties of Solution of Ammonium Acetate.

(Committee.)

1858.

Liquor Ammoniae Acetatis.

Brit. Pharmac., 1 ed., p. 267.

Gives the official Latin and English titles, methods of preparation and uses of Solution of Ammonium Acetate.

(Committee.)

1859.

Ammonia acetica liquida.

Baver. Pharmac., --ed., p. 21.

Gives the Latin and German titles, synonyms, method of preparation and properties of Solution of Ammonium Acetate.

Maisch, J.M.

1860.

Chemical Notes.

Am. Jour. Pharm., 32, p. 523.

Discusses the problem of making a neutral solution of ammonium acetate and some suggestions are given to aid in so doing, and the methods of preparation of the American and European Pharmacopoeias are discussed.

Anthon, E.F.

1861.

Liquor Ammonii Acetici.

Handwörterb., 2 ed., p. 266.

All the synonyms appearing in the list from 1 ed., 1833, which are starred (*) together with the following:-

Aqua acetatis ammonii.

Acetas ammonii liquidus.

(Committee.)

1861.

Liquor Ammonii acetici.

Pharmaco. Hannoverana, --ed., p. 381.

Gives the official Latinized title, synonym, method of preparation, properties and dose of Solution of Ammonium Acetate.

Strumpf, F.L.

1861.

Liquor Ammoniaci Acetici.

Allgemeine Pharmak., 1 ed., p. 334.

Gives the formulas of various Pharmacopoeias, methods of preparation and comments on Solution of Ammonium Acetate.

Dobereiner, F.

1862.

Essigsures Ammoniumoxyd oder Ammoniak.

Chemisch. Schule d. Pharm., 1 ed., p. 584.

Gives a method of preparation and the properties of Solution of Ammonium Acetate.

Maisch, J.M.

1862.

Liquor Ammoniae Acetatis.

Am. Jour. Pharm., 32, p. 523. (Proc. A. Ph. A., 10, p. 130.)

Recommends preparing Solution of Ammonium Acetate by neutralizing acetic acid with ammonia.

Proctor, B.S.

1863.

Liquor Ammoniae Acetatis.

Chem. & Drugg., 4, p. 152.

Discusses variations in the strength of Solution of Ammonium Acetate.

Atkinson, R.M.

1864.

Liquor Ammoniae Acetatis, B.P.

Pharm. Jour., S.2, 5, p. 462.

States that this solution was introduced by Raymond Min-
derer in 1621, and that it is made by saturating strong vine-
gar with spirit of hartshorn. Also discusses the attempts
made to obtain a concentrated Solution of Ammonium Acetate.

King, J.

1864.

Liquor Ammoniae Acetatis.

Am. Dispens., 6 ed., p. 1045; *ibid.*, 8 ed., p. 1055; *ibid.*,
10 ed., p. 1055.

Gives the official Latin and English titles, methods of
preparation, history, properties and uses of Solution of Am-
monium Acetate.

(-----).

1864.

Solution of Acetate of Ammonium.

Pharm. Jour., 23, p. 462. (Proc. A. Ph. A., 12, p. 76.)

States that the British Pharmacopoeias direct that this preparation is to be made directly from a solution of ammonia instead of its carbonate.

Byrnes, T.

1865.

(Liquor Ammoniae Acetatis.)

Med. & Surg. Rep., --ed., p.---. (Am. Jour. Pharm., 37, p. 387.)

(Discusses a number of variations in the Solution of Ammonium Acetate, being either too alkaline or too acidic, and the difficulty encountered in trying to make a truly neutral liquid, as wanted by doctors.)

Wood, G.B. & Bache, F.

1865.

Liquor Ammoniae Acetatis.

Dispens. U.S.A., 12 ed., p. 1190; *ibid.*, 13 ed., p. 1239; *ibid.*, 14 ed., p. 1279.

Gives the official Latin and English titles of 2 Pharmacopoeias, methods of preparation, physical and medical properties, uses and dose of Solution of Ammonium Acetate.

(Editor.)

1866.

Liquor Ammonii Acetici.

Jahrb. d. Pharm., 26, p. 195.

Discusses sweetening Solution of Ammonium Acetate.

Pile, W.H.

1866.

On Solution of Acetate of Ammonia.

Proc. A. Ph. A., 14, p. 226. (Am. Jour. Pharm., 39, p. 45.)

States that Solution of Ammonium Acetate was first described by Boerhaave in 1732, and that it was introduced into medical use by him. Also that he prepared it in a similar manner to that used now, and that, subsequently, Minderer, a Scottish physician, by bringing it further into notice, claimed the honor of its discovery, and the solution was hence known as "Spiritus Mindereri". Discusses in detail the difficulties encountered in attempting to make a neutral Liquor Ammoniae Acetatis and explains why.

Squibb, E.R.

1866.

Liquor Ammoniae Acetatis.

Proc. A. Ph. A., 14, p. 47.

Gives some practical suggestions concerning a method of obtaining a neutral solution and whether or not carbonic acid is a needed and useful part of the solution.

(Committee.)

1867.

Liquor Ammoniae Acetatis.

Brit. Pharmac., 2 ed., p. 177.

Gives the official Latin and English titles, method of preparation and dose of Solution of Ammonium Acetate.

Tolmatsched, ---.

(1868.)

(External Use of Liquor Ammoniae Acetatis.)

(N.Y. Med. Jour., --ed., p. 154; (Drugg. Circ., 13, p. 15.)

(Gives an account of the Solution of Ammonium Acetate being used externally in cases of muscular rheumatism and in some cases of pneumonia.)

Hoefer, F.

1869.

Chimie Pharmaceutique.

Hist. d. l. Chim., 2, p. 237.

States that Raymond Minderer had attached his name to the Solution of Ammonium Acetate, and gives a list of books written by him.

Squibb, E.R.

1869.

Liquor Ammoniae Acetatis.

Proc. A. Ph. A., 17, p. 335.

States that filtration should be avoided and that the formula given in the United States Pharmacopoeia makes too much of the Solution of Ammonium Acetate at one time.

Buchner, L.A.

1872.

Essigsäure Ammoniumflüssigkeit.

Comment. z. Pharmaco. German., 1 ed., p. 167.

Gives the properties and a method of preparing the Solution of Ammonium Acetate.

Fredericks, R.W.

1873.

Solution of Acetate of Ammonium.

Pharm. & Chem. Rec., 6, p. 135. (Proc. A. Ph. A., 21, p. 182.)

Gives a method of preparing a concentrated solution of ammonium acetate, with directions for carrying it out.

Hirsch, B.

1873.

Liquor Ammoniae Acetici.

D. Pharmaco. German., 1 ed., p. 206.

Discusses the preparation, properties and uses of Solution of Ammonium Acetate.

Parrish, E.

1874.

Liquor Ammonii Acetatis.

Treatise on Pharm., 4 ed., p. 198; *ibid.*, 5 ed., p. 264.

Gives synonyms, method of preparation and dose of Solution of Ammonium Acetate.

Siebold, L.

1874.

Presence of Lead in Liquor Ammoniae Acetatis.

Yrbk. Br. Ph. Conf., 11, p. 549. (Proc. A. Ph. A., 23, p. 74.)

Gives an account of lead being present in Solution of Ammonium Acetate, the source of which is attributed to the glass in which it is stored.

Maisch, J.M.

1875.

Dry Acetate of Ammonium.

Am. Jour. Pharm., 47, p. 25.

Gives the method of preparation used by Bertholet and a few of the properties of the resulting compound.

Bernhardt, R.H.

1876.

Solution of Acetate of Ammonia.

Drugg. Circ., 20, p. 118. (Proc. A. Ph. A., 25, p. 84.)

Finds that Solution of Ammonium Acetate prepared by saturating dilute acetic acid with ammonia water keeps better than when made by the official method.

Thresh, J.C.

1876.

Liquor Ammoniae Acetatis, B.P.

Pharm. Jour., 35, p. 781. (Proc. A. Ph. A., 24, p. 81.)

Finds this preparation to be carelessly prepared and of variable strength and gives a general discussion of Solution of Ammonium Acetate.

Elsner, F.

1878.

Ammonium Aceticum.

Leitfad. z. vorbereit. a. d. deutsch. apotheker-gehulfen-
prufung, 1 ed., p. 118; *ibid.*, 2 ed., p. 115; *ibid.*, 3 ed.,
p. 146.

Gives a method of preparation of Solution of Ammonium Acetate.

Woodcock, W.H.

1878.

Solution of Acetate of Ammonia.

Drugg. Circ., 22, p. 182. (Pharm. & Chem. Red., 11, p. 331.)

Gives directions for keeping a Solution of Ammonium Acetate ready and in a perfectly fresh condition.

Bedford, P.W.

1879.

Liquor Ammonii Acetatis.

Drugg. Circ., 23, p. 89. (Proc. A. Ph. A., 27, p. 85.)

(Pharm. & Chem. Rec., 12, p. 224.)

Explains the permanganate test for detecting "empyreuma" in the acetic acid and carbonate of ammonia used to make Solution of Ammonium Acetate.

Flueckiger, F.A.

1879.

Ammoniumacetat.

Pharmaceutisch. Chem., (led.), p. 563.

Gives a history of Solution of Ammonium Acetate, stating that Minderer had named this preparation after himself, calling it Spiritus ophthalmicus Mindereri.

Twaddell, ---.

1879.

Liquor Ammoniae Acetatis.

Pharm. Jour., 39, P. 1009.

Gives a method of preparing a concentrated Solution of Ammonium Acetate.

Woodcock, P.D.

1879.

Liq. Ammon. Acet. Conc. 1 to 7.

Pharm. Jour., 39,,p. 1009.

Gives a method of preparing a neutral Solution of Ammonium Acetate and gives directions for correcting it, if it is not exactly neutral.

Rother, R.

1880.

Solution of Ammonium Acetate.

New Rem., 9, p. 354. (Proc. A. Ph. A., 29, p. 76.)

Recommends that a more concentrated Solution of Ammonium Acetate be substituted for the official weak preparation and gives a formula for making the concentrated solution.

Schmidt, E.

1882.

Liquor Ammonii Acetici.

Ausfuhr. Lehrb. d. Pharm. Chem., 1 ed., v.2, p. 270.

Gives synonyms, a method of preparation, description and tests for Solution of Ammonium Acetate.

Maisch, J.M.

1883.

Comparison of Galenical Preparations of the United States and German Pharmacopoeias.

Am. Jour. Pharm., 55, p. 440.

Gives the official Latinized titles of the U.S.P. and P.G., and methods of preparation with explanations for the solution of Ammonium Acetate.

Weiss,----.

1883.

(Ammonium Aceticum.)

Zeit. Pharm., 28, p.----. (Jahresb. d. Pharm., 43, p. 565.)

Gives a method of preparing solution of Ammonium Acetate and states that it should give a violet color with litmus.

Wood, G.B. & Bache, F.

1883.

Liquor Ammonii Acetatis.

Dispens. U.S.A., 15 ed., p. 859; *ibid.*, 16 ed., p. 887.

Gives the official Latinized and English titles of 4 Pharmacopoeias, formulas for chemicals from which it is prepared, methods of preparation, physical, chemical and medical properties and uses of Solution of Ammonium Acetate.

Buchner, L.A.

1884.

Essigsäure Ammoniumflüssigkeit.

Comment. z. Pharmaco. German., v.2, Pt.2, p. 212.

States that the Spiritus Minderer got its name from that of Raymond Minderer who lived in Augsburg, and who particularly recommended this preparation.

(Editor.)

1884.

Liquor Ammonii Acetatis.

Pharm. Rec., 4, p. 217.

Discusses methods used in preparing Solution of Ammonium Acetate.

Rother, R.

1884.

Liquor Mindereri.

New Idea, 2, p. 311. (Pharm. Rec., 4, p. 217.)

Discusses methods of preparing Solution of Ammonium Acetate.

Stille, A. & Maisch, J.M.

1884.

Liquor Ammonii Acetatis.

Natl. Dispens., 3 ed., p. 892.

Gives the official Latin and English titles of several Pharmacopoeias, methods of preparation, properties, physiological actions, an official preparation of and medical uses of Solution of Ammonium Acetate.

(Committee.)

1885.

Liquor Ammonii Acetatis.

Brit. Pharmaco., 3 ed., p. 230.

Gives the official Latin and English titles, synonyms

and methods of preparation of Solution of Ammonium Acetate.

Hirsch, A.

1885.

Minderer, Raimund.

Allgemeine Deut. Biog., 21, p.---

Gives a brief sketch of Minderer's life, stating that a Solution of Ammonium Acetate bears Minderer's name as Liquor (or Spiritus) Mindereri.

(Committee.)

1886.

Liquor Ammonii Acetatis Concentratus.

Proc. A. Ph. A., 34, p. 242.

Gives data of the preliminary draft of a National Formulary, with Latin and English titles, method of preparation and use of Solution of Ammonium Acetate according to the Kentucky formulary.

Remington, J.P.

1886.

Liquor Ammonii Acetatis.

Remington's Prac. of Pharm., 1 ed., p. 504; *ibid.*, 2 ed., p. 556; *ibid.*, 3 ed., p. 596.

Discusses the preparation, properties and uses of Solution of Ammonium Acetate.

Hager, H.

1888.

Ammonum aceticum.

Handb. d. Pharm. Prax., new ed., Bk. 1, 7th printing, p. 295.

Gives synonyms and sample prescriptions using Solution of Ammonium Acetate.

Heder, ---.

1888.

Liquor Ammoniae Acetatis, 1-7.

Chem. & Drugg., 32, p. 442.

Gives a method of preparing a 1-7 Solution of Ammonium Acetate.

Huguet, R.

1888.

Acetate D'Ammoniaque.

Traite d. Pharm., 1 ed., p. 318.

Gives methods of preparation, uses and history of Solution of Ammonium Acetate.

Beckurts, H. & Hirsch, B.

1889.

Liquor Ammonii Acetici.

Handb. d. Praktisch. Pharm., 2 ed., p. 193.

Gives methods of preparing Solution of Ammonium Acetate.

Proctor, B.S.

1889.

Liquor Ammoniae Acetatis.

Chem. & Drugg., 35, p. 448. (Pharm. Era, 3, p. 273.)

Gives several methods of preparation of Solution of Ammonium Acetate.

Schlickum, ---.

1889.

Liquor Ammonii Acetici.

Real-Encyclopadie, 1 ed., v.6, p. 325; *ibid.*, v.7, p. 51;
ibid., 2 ed., v.7, p. 51.

Gives methods of preparation according to various Pharmacopoeias, assay, description and uses of Solution of

Ammonium Acetate.

Williams, J.K.

1889.

Liquor Ammonium Acetatis.

West. Drugg., 11, p. 80. (Proc. A. Ph. A., 37, p. 386.)

Discusses the decomposition and preparation of Solution of Ammonium Acetate.

Fennel, C.

1890.

Liquor Ammonii Acetatis.

Am. Drugg., 19, p.2.

States that the specific gravity as given in the U.S.P. is too high and variable and that other points are not correct concerning Solution of Ammonium Acetate.

Hawkins, L.W.

1890.

Liquor Ammonii Acetatis Fortior.

Pharm. Jour., 49, p. 945.

Discusses the methods of preparing the Solution of Ammonium Acetate and the merits of each. Also tells of having tested commercial samples of the solution and finding none of them the same strength as was stated on the label of the bottle tested.

Hirsch, B.

1890.

Liquor Ammonii Acetici.

Univer. Pharmako., 1 ed., v.2, p. 75; *ibid.*, 2 ed., v.1, p. 517.

Gives synonyms, method of preparation and a description

of Solution of Ammonium Acetate.

Fischer, B.

1891.

Liquor Ammonii Acetici.

Lehrb. d. Chem. f. Pharm., 2 ed., p. 386; *ibid.*, 5 ed., p. 348.

Gives a method preparation for Solution of Ammonium Acetate.

Meyer, E. von

1891.

Ammonium acetate.

A Hist. of Chem., (1 ed.), Engl. transl., p. 90.

States that the last acetate, known as Spiritus Mindereri from its discoverer, the physician Raymund Minderer, was much valued as a medicine.

Brenstein,---.

1892.

Liquor Ammonii Acetici.

Pharm. Zeit., 4, p. 28. (Jahresb. d. Pharm., 27, p. 335.)

Discusses the preparation of a Solution of Ammonium Acetate which is free from empyreuma.

Dieterich, E.

1892.

Liquor Ammonii Acetici.

Neues Pharmaceu. Man., 5 ed., p. 264; *ibid.*, 6 ed., p. 272; *ibid.*, 9 ed., p. 266; *ibid.*, 11 ed., p. 283; *ibid.*, 14 ed., p. 300.

Gives several methods of preparing Solution of Ammonium Acetate.

Liquor Ammonii Acetatis Fortior.

Proctor's Lect. on Prac. Pharm., 3 ed., p. 155.

Discusses the preparation and methods of testing the neutrality of Solution of Ammonium Acetate.

Kerr, ---.

1893.

Liquor Ammonii Acetatis bei Delirium tremens.

Pharm. Rundschau, 11., p. 217.

Discusses the use of Solution of Ammonium Acetate in cases of delirium tremens.

Coblentz, V.

1894.

Liquor Ammonii Acetatis.

Handb. of Pharm., 1 ed., p. 227; *ibid.*, 2 ed., p. 227.

Discusses a method of preparing Solution of Ammonium Acetate.

Stille, A., Maisch, S.M. & Caspari, C.

1894.

Liquor Ammonii Acetatis.

Natl. Dispens., 5 ed., p. 948.

Gives the official Latin and English titles of various Pharmacopoeias, methods of preparation with equations, properties, action and uses of Solution of Ammonium Acetate.

Wood, H.C., Remington, J.P. & Sadtler, S.P.

1894.

Liquor Ammoniae Acetatis.

Dispens. U.S.A., 17 ed., p. 789; *ibid.*, 18 ed., p. 788.

Gives the official Latin and English titles of 2 Pharm-

apocoeias, method of preparation with formula and molecular weight, official titles of several Pharmacopoeias, chemical and physical properties, equation for preparation, medical properties and uses of Solution of Ammonium Acetate.

Berendes, J.

1895.

Ammoniumacetat.

Angehende Apothek., 1 ed., p. 411.

Discusses Solution of Ammonium Acetate, giving a description of it.

Groff, J.E.

1895.

Neutral Solution of Ammonium Acetate.

West. Drugg., 17, p. 23.

Gives a method of making a neutral Solution of Ammonium Acetate.

Kreuz, C.

1896.

Ammonium aceticum solutum.

Repetitor. d. Pharm., 7, p. 78.

Gives the official Latin and German titles, description, concentration and properties of Solution of Ammonium Acetate.

Guareschi, I.

1897.

Spirito del Minderer.

Commentar. d. Farmacop. Ital., v.1, Pt.1, p. 38.

Gives synonyms of Solution of Ammonium Acetate, a method of preparation and states that Raymond Minderer was the first to propose the use of this medicament.

Andouard, A.

1898.

Acetate D'Ammonium.

Nouv. Elemen. d. Pharm., 5 ed., p. 394; *ibid.*, 6 ed., p. 579.

Gives a method of preparation and discusses the history of Solution of Ammonium Acetate, stating that Minderer was the discoverer of the solution.

(Committee.)

1898.

Liquor Ammonii Acetatis.

Brit. Pharmac., 4 ed., p. 177; *ibid.*, 5 ed., p. 211.

Gives the official Latin and English titles, method of preparation, a test for neutrality, dose and method of preservation of Solution of Ammonium Acetate.

Dorvault, P.S.M.

1898.

Acetate d'ammoniaque liquide.

L'Officine, 4 ed., p. 62; *ibid.*, 7 ed., p. 195; *ibid.*, 10 ed., p. 195; *ibid.*, 14 ed., p. 192; *ibid.*, 15 ed., p. 279; *ibid.*, 17 ed., p. 299.

Gives 11 synonyms, method of preparation, and states that Boerhaave introduced Solution of Ammonium Acetate in 1732.

(Editor.)

1898.

Coloration of Solution of Ammonium Acetate.

Pharm. Jour., 60, p. 86.

Gives his opinion of the cause of coloration of this solution of ammonium acetate and a method of getting rid of it.

Lucas, E.W.

1898.

Liquor Ammonii Acetatis.

Prac. Pharm., 1, p. 165.

Gives a method of preparing Solution of Ammonium Acetate.

Andre, G.

1899.

Liquor Ammonii Acetici als Gegengift bei Formaldehyd.

Zeitschr. d. oesterr. apoth. ver., 37, p. 550.

Discusses the use of Solution of Ammonium Acetate as an antidote for formaldehyde.

Andre, M.

1899.

Empoisonnement par le formol.

Jour. d. Pharm. d. Chim., S6, v.10, p. 10. (Schweiz. Wochensch. f. Chem. u. Pharm., 37, p. 456. Am. Jour. Pharm., 72, p. 493.)

Reports an accident in which a woman took a formaldehyde solution and Ammonium Acetate Solution was successfully administered. The amount of the solution and the conditions accompanying the administration are also given.

Cummings, C.

1899.

Liq. Ammon. Acet.

Chem. & Drugg., 54, p. 194.

Discusses methods of preparation and desirability of uniform strength of Solution of Ammonium Acetate.

Hill, J.R.

1899.

The B.P. Solution of Acetate and Citrate of Ammonia.

Chem. & Drugg., 54, p. 92.

Discusses methods of preparing Solution of Ammonium A-

cetate.

Hill, J.R.

1899.

Solution of Ammonium Acetate.

West. Drugg., 21, p. 616.

Discusses several methods of preparing Solution of Ammonium Acetate.

Husemann, T.

1899.

Raymund Minderer und die Augsburger Pharmakopoen von
1613-1629.

Pharm. Zeit., 44, p. 702.

Gives a history of the life of Minderer, Raymund, stating that he is known to the present generation by a pharmaceutical preparation, Spiritus Mindereri. Also says that some historians in medicine believe the present day Spiritus Mindereri to be the same as the preparation of Minderer, but that it is not, due to the fact that there is nothing in the Augsburg Pharmacopoeias, which are designated as the "Pharmacopoeias of Minderer", about ammonium acetate, and that a Spiritus Mindereri is first found in the Mantissa hermetica in the 1643 edition of the Augustana, and remained there until the last edition in 1734. However, the Spiritus Mindereri had nothing to do with ammonium acetate, but was a distillate of a number of plant drugs as listed in the reference, and the original Spiritus Mindereri had to yield its name to a very different preparation. Ammonium acetate, the present Spiritus Mindereri, is found in a different preparation of Minderer, the Aqua acovistica, which Henisius introduced into the Augsburg Pharmacopoeia in 1643.

Chem. & Drugg., 60, p. 95.

Gives a method of preparing Solution of Ammonium Acetate of the above strength.

H.A.T.

1902.

Spiritus Mindererii.

Am. Drugg. & Pharm. Rec., 40, p. 248.

Discusses methods of preparation and strength of the resulting Solution of Ammonium Acetate.

Thomson, J.H.

1902.

Solution of Acetate of Ammonium.

Chem. & Drugg., 61, p. 306.

Gives a method of preparing Solution of Ammonium Acetate.

Bennett, C.T.

1903.

Lead in Acetic Acid and Ammonium Acetate.

Chem. & Drugg., 63, p. 436. (Jahrb. d. Pharm., 38, p. 214.)

Discusses the presence of lead in Solution of Ammonium Acetate.

Dufour, L.

1903.

Acetate d'ammoniaque liquide. Esprit de Mindererus.

Manuel d. Pharm. Prat., 1 ed., p. 61.

Discusses the preparation and properties of Solution of Ammonium Acetate.

Gilmour, J.P.

1903.

Ammonium Acetate Solution.

Pharm. Jour., 70, p. 95. (Yrbk. Br. Ph. Conf., 40, p. 262.)

Discusses the use of cochineal solution as indicator in determining the neutrality of Solution of Ammonium Acetate.

Dupuy, E. & Ribaut, A. 1904.

Acetate d'ammoniaque.

Cours. d. Pharm., 2 ed., Pt. 4, p. 325.

Gives a method of preparing Solution of Ammonium Acetate.

(Editor.) 1904.

Liq. Ammon. Acet. 1 to 7.

Chem. & Drugg., 65, p. 770.

Gives a method of preparing Solution of Ammonium Acetate.

Lewis, S.J. 1904.

Liquor Ammonii Acetatis.

Chem. & Drugg., 65, p. 839.

Discusses the contraction occurring on diluting concentrated Solution of Ammonium Acetate.

Schelenz, H. 1904.

Spiritus Mindereri.

Geschicht. d. Pharm., 1 ed., p. 540.

States that Ammonium Acetate as Spiritus Mindereri was discovered by Minderer in 1634.

Schelenz, H. 1904.

Spiritus oder Liquor Mindereri.

Geschicht. d. Pharm., 1 ed., p. 482.

States that Raymund Minderer discovered the Ammonium Acetate, known as Spiritus or Liquor Mindereri, and that it was first made known by Pachenius in his works.

Fisk, F.E.

1905.

Solution of Ammonium Acetate.

Bull. Pharm., 19, p. 430.

Discusses the preparation of a fresh Solution of Ammonium Acetate.

Fisk, F.E.

1905.

Liquor Ammonii Acetatis.

Pharm. Era., 34, p. 530.

Tells of the difficulties encountered in making the Solution of Ammonium Acetate to the right strength, due to the variation in strength of the acetic acid used.

Merson, G.F.

1905.

Solution of Ammonium Acetate.

Pharm. Jour., 74, p. 70. (Chem. & Drugg., 66, p. 78. Pharm. Zeit., 50, p. 90. Jahr. d. Pharm., 65, p. 249.)

Discusses the methods of testing the neutrality of Solution of Ammonium Acetate.

Remington, J.P.

1905.

Liquor Ammonii Acetatis Concentratis.

Remington's Prac. of Pharm., 4 ed., p. 1356.

Gives the method of preparation of concentrated Solution of Ammonium Acetate.

Caspari, C.

1906.

Solution of Ammonium Acetate.

Treatise on Pharm., 3 ed., p. 231; *ibid.*, 4 ed., p. 240; *ibid.*, 7 ed., p. 259.

Discusses the preparation of Solution of Ammonium Acetate.

(Editor.)

1907.

Ammonium Acetate as a Diaphoretic.

Chem. & Drugg., 71, p. 909.

Discusses the use of Solution of Ammonium Acetate as a diaphoretic with the dose given.

R.H.T.

1907.

Indicator for Liq. Ammon. Acet. Fort.

Pharm. Jour., 78, p. 548.

Claims that there is no indicator which will satisfactorily show when this preparation is exactly neutral.

Wood, H.C., Remington, J.P. & Salter, S.P.

1907.

Liquor Ammoniae Acetatis.

Dispens. U.S.A., 19 ed., p. 703.

Gives the official Latin and English titles of several pharmacopoeias, definition and formula with molecular weight, methods of preparation with equations for the reactions, properties, uses, official preparation and dose.

(Editor.)

1908.

Liq. Ammon. Acet. 1 to 7.

Chem. & Drugg., 72, p. 102.

Gives a method of preparation of Solution of Ammonium Acetate of the above strength.

(Editor.)

1909.

Liq. Ammon. Acet. (1-7).

Chem. & Drugg., 75, p. 592.

Gives a method of preparation for Solution of Ammonium Acetate of the above strength.

(Editor.)

1909.

Dispensing Solution of Ammonium Acetate.

Drugg. Circ., 53, p. 526.

Gives a method of preparing Solution of Ammonium Acetate.

Schlickum, L.R.

1909.

Liquor Ammonii Acetici.

Ausbild. d. jungen Pharmazeu., 11 ed, p. 724.

Gives a synonym, method of preparation and properties of Solution of Ammonium Acetate.

Wray, P.C.

1909.

Dispensing Solution of Ammonium Acetate.

Drugg. Circ., 53, p. 526.

Gives his method of dispensing Solution of Ammonium Acetate, as well as a method of preparation.

Beal, J.H.

1910.

Solution of Ammonium Acetate.

Elements of Pharm., 2 ed., p. 70.

Gives the official Latin and English titles, synonyms, method of preparation and description of Solution of Ammonium Acetate.

(Editor.)

1911.

Liq. Ammon. Acet. Conc. (1-7).

Chem. & Drugg., 78, p. 494.

Gives another method of preparation of Solution of Ammonium Acetate of the above strength.

Brown, J.F.

1913.

Liquor Ammoniae Acetatis Fortior.

Pharm. Jour., 90, p. 579.

Discusses various strengths of Solution of Ammonium Acetate.

(Editor.)

1913.

Liq. Ammon. Acet. Conc., 1-8.

Pharm. Jour., 91, p. 799.

Gives a method of preparing a Solution of Ammonium Acetate of the above strength.

Fairfax, ---.

1913.

Liq. Ammon. Acet. Conc. (1 to 7.).

Chem. & Drugg., 83, p. 932.

Gives a method of preparing Solution of Ammonium Acetate.

Brown, J.F.

1914.

Concentrated Ammonium Acetate Solution.

Pharm. Jour., 92, p. 316.

Gives a method of preparing a 1-7 Solution of Ammonium Acetate.

(Editor.)

1914.

Liquor Ammonii Acetatis.

Chem. & Drugg., 85, p. 551.

Gives a method of preparation and the specific gravity of the resulting Solution of Ammonium Acetate.

Elwell, F.B.

1914.

Concentrated Ammonium Acetate Solution.

Pharm. Jour., 92, p. 353.

Tells of Tincture of Ferric Perchlorate being prescribed with Solution of Ammonium Acetate because of objections to the "carbonate" taste of Solution of Ammonium Acetate.

(Editor.)

1916.

Liq. Ammon. Acet. Conc., (1 in 7).

Chem. & Drugg., 88, p. 640.

Gives a method of preparing a 1 in 7 solution of ammonium acetate.

Slack, H.F.

1916.

Liq. Ammon. Acet.

Chem. & Drugg., 88, p. 364. (Yrbk. Br. Ph. Conf., 53, p. 376.)

Gives a method of testing the neutrality of Solution of Ammonium Acetate.

(Editor.)

1917.

Liquor Ammonii Acetatis Dilutus (?).

Drugg. Circ., 61, p. 77.

A question was sent to the above circular, concerning a prescription calling for "Liquor Ammonii Acetatis Dilutus", and the asker was advised to consult the doctor before filling such a prescription, to determine exactly what was wanted.

Remington, J.P. and Wood, H.C., Sadtler, S.P.

1918.

Liquor Ammoniae Acetatis.

Dispens. U.S.A., 20 ed., p. 626.

Gives the official Latin and English titles of several Pharmacopoeias, definitions, formula with molecular weight, methods of preparation with equations for the reactions, properties, uses, official preparation and dose of Solution of Ammonium Acetate.

Sayre, L. & Haverhill, L.

1918.

Liquor Ammonii Acetatis.

Essentials on Pharm., 1 ed., p. 336.

Gives synonyms, method of preparation, use and dose of Solution of Ammonium Acetate.

Cowley, R.C.

1919.

(Liquor Ammonii Acetatis Concentratis.)

Australasian Jour. Pharm., v.--, p.--. (Pharm. Jour., 103, p. 215.)

(Discusses the method of making a 1-7 solution of ammonium acetate and gives directions for arriving at the necessary fig-

ures.

G.H.C.

1919.

Liq. Ammon. Acet. Conc., 1-7.

Pharm. Jour., 102, p. 116.

Gives a method of preparing a 1-7 Solution of Ammonium Acetate.

Goldby, F.

1919.

Liq. Ammon. Acet. Conc. (1 to 7).

Pharm. Jour., 102, p. 159. (Yrbk. A. Ph. A., 8, p. 93. Jahrb. d. Pharm., 79, p. 215. Yrbk. Br. Ph. Conf., 56, p. 272).

Gives a method of preparing a 1 to 7 Solution of Ammonium Acetate.

Lucas, E.W.

1921.

Liquor Ammonii Acetatis.

Prac. Pharm., 3, p. 182.

Gives a method of preparing a neutral Solution of Ammonium Acetate and gives directions for storage of it.

(Committee.)

1922.

Liquor Ammonii Acetatis Concentratis.

Pharm. Jour., 54, p. 502, (Yrbk. Br. Ph. Conf., 59, p. 269.)

Gives a method of preparing a concentrated Solution of Ammonium Acetate.

(Editor.)

1922.

(Liquor Ammonii Acetatis).

Chem. & Drugg., 98, p. 420. (Yrbk. Br. Ph. Conf., 60, p. 395.)

Discusses the reaction taking place between Solution of Ammonium Acetate and Tincture of Ferric Perchloride.

Stamm, D.M.

1922.

Solution of Ammonium Acetate.

Prac. Drugg., 40, p. 23. (Yrbk. A Ph. A., 11, p. 65.)

Gives a new formula for the preparation of the Solution of Ammonium Acetate, with exactly equal amounts of the 2 solutions, one of acetic acid and water, and the other of ammonium carbonate and water, being carefully mixed.

(Editor.)

1923.

Bottle-bursting Difficulty.

Chem. & Drugg., 98, p. 176.

Discusses explosive properties of Solution of Ammonium Acetate and gives a method of preparation to prevent this difficulty.

Goigoux, P.

1923.

Acetate D'Ammonium Dissous.

L. Livre d. Preparat. e Pharm., 1 ed., p. 240.

Gives a method of preparation and uses of Solution of Ammonium Acetate.

Cowley, R.C.

1924.

(Liquor Ammon. Acet., B.P.)

Australas. Jour. Pharm., 5, p. 899. (Pharm. Jour., 114, p. 700).

(Gives what he terms the correct amounts of the ingredients to be used in making Solution of Ammonium Acetate.

Bentley, A.O.

1926.

Liquor Ammonii Acetatis.

Text-book of Pharmaceu., 1 ed., p. 277; *ibid.*, 2 ed., p. 370.

Gives the Latin and English titles, synonym and method of preparation of Solution of Ammonium Acetate.

(Cook, E.F.)

1926.

Liquor Ammonii Acetatis.

Remington's Prac. of Pharm., 7 ed., p. 652.

Gives the U.S.P. method of preparation, physical properties, a caution, tests, assay, uses and history of Solution of Ammonium Acetate. States that Raymond Minderer was one of the most famous physicians of his time, and that he devised the preparation which bears his name to-day, and first prepared it from vinegar and hartshorn.

(Editor,)

1926.

Liq. Ammon. Acet. Conc. 1-7.

Pharm. Jour., 116, p. 502.

Gives a method of preparation of Solution of Ammonium Acetate of the above strength.

Remington, J.P., Wood, H.C. and Sadtler, S.P.

1926.

Gives official Latin and English titles of several Pharmacopoeias, definition and formula with molecular weight, methods of preparation with equations for reactions, properties, uses,

official preparation, assay, abbreviation, a caution, dose and a limit of Ammonium Acetate in the Solution.

Allport, N. & Cocking, T. 1927.

Solution of Ammonium Acetate, B.P.

Chem. & Drugg., 107, p. 15.

Discusses the data given in the British Pharmacopoeia on Solution of Ammonium Acetate.

Allport, N. & Cocking, T.T. 1927.

Solution of Ammonium Acetate, B.P.

Pharm. Jour., 118, p. 719. (Yrbk. A. Ph. A., 16, p. 70).

Discusses variations in Solutions of Ammonium Acetate, as to methods of testing, neutralization and methods of preparation.

(Editor.) 1927.

Ammonium Acetate with Sodium Salicylate.

Chem. & Drugg., 107, p. 160.

Discusses the supposed incompatibility of Solution of Ammonium Acetate with sodium salicylate.

(Editor.) 1927.

(Liquor Ammonium Acetate.)

Chem. & Drugg., 107, p. 319. (Yrbk. Br. Ph. Conf., 64, p. 314).

Discusses what happens when Solution of Ammonium Acetate and Tincture of Ammoniated Quinine are present in a mixture.

Kitchingman, J.T. 1927.

Liquor Ammonii Acetatis.

Pharm. Jour., 118, p. 27.

Discusses the dissociation which is believed to take place when Solution of Ammonium Acetate is boiled, yielding free ammonia and acetic acid.

Lawall, C.H.

1927.

Spiritus Mindererus.

Four Thousand Years of Pharm., 1 ed., p. 250.

States that Raymond Minderer, a famous physician of the 17th century, is the originator of Solution of Ammonium Acetate, commonly called Spiritus Mindereri, which was originally made from distilled vinegar and crude spirit of hartshorn.

Sage, E.C.

1927.

Liquor Ammonii Acetatis.

Pharm. Jour., 118, p. 27. (Yrbk. A. Ph. A., 16, p. 70.)

Discusses official U.S.P. and B.P. Solutions of Ammonium Acetate as to methods of preparation, ingredients, preservation and concentration.

(Editor.)

1928.

Liq. Ammon. Acet. Conc. 1-7.

Pharm. Jour., 120, p. 290.

Gives a method of preparing Solution of Ammonium Acetate of the above strength.

(Editor.)

1929.

Ammonium Acetate and Iron Perchloride.

Chem. & Drugg., 110, p. 147.

Discusses the chemical change which takes place when Solution of Ammonium Acetate is treated with iron perchloride.

(Editor.)

1929.

Liq. Ammon. Acet. Conc. 1-7.

Pharm. Jour., 122, p. 464.

Gives a method of preparation of Solution of Ammonium Acetate of the above strength.

Cooper, J.W. & Appleyard, F.N.

1930.

Solution of Ammonium Acetate.

A Course in Prac. Pharm., 1 ed., p. 95.

Gives a method of preparation of Solution of Ammonium Acetate.

Cooper, J.W.

1930.

Liquor Ammonii Acetatis.

Pharm. Gen. & Off., 1 ed., p. 233.

Gives a method of preparation, caution for storage and method of testing for neutrality of Solution of Ammonium Acetate.

(Editor.)

1930.

Liquor Ammonii Acetatis.

Chem. & Drugg., 113, p. 556.

Gives several methods of preparation of Solution of Ammonium Acetate.

Lupton, A.W.

1930.

Three-Minute Tests for Pharmacists.

Chem. & Drugg., 112, p. 447.

Discusses methods of neutralizing Solution of Ammonium Acetate.

(Editor.)

1931.

Liq. Ammon. Acet. Conc. 1-7.

Pharm. Jour., 126, p. 476.

Gives the formula and method of preparation of Solution of Ammonium Acetate from the new British Pharmacopoeia.

Bari, S. von

1932.

Wertbestimmung des Kalium Aceticum Solutum und des Ammonium Aceticum Solutem.

Archiv. d. Pharm., 270, p. 201. (Yrbk. A. Ph. A., 21, p. 557. Jahr. d. Pharm., 92, p. 144.)

Gives a method of evaluation of Ammonium Acetate in the Solution.

(Committee.)

1932.

Liquor Ammonii Acetatis Dilutus.

Brit. Pharmaco., 6 ed., p. 253.

Gives the official Latin and English titles, abbreviation, synonyms, method of preparation, tests for purity, assay and method of storage of Solution of Ammonium Acetate.

Mindes, J.

1932.

Ammonium aceticum solutum.

Pharmazeutisch. Kompend., 1 ed., p. 44,

Gives a Latin title, properties, and method of prepara-

tion of Solution of Ammonium Acetate.

Bennett, R.R. & Cocking, T.T.

1933.

Liquor Ammoniae Acetatis Fortis.

Science & Prac. of Pharm., 2 ed., p. 295.

Discusses the preparation of a dilute and a strong Solution of Ammonium Acetate.

Bentley, A.O.

1933.

Liquor Ammonii Acetatis Dilutus.

Text-book of Pharmaceu., 3 ed., p. 717.

Gives Latin and English titles, synonyms, method of preparation and dose of Solution of Ammonium Acetate.

(Editor.)

1934.

(A Prescription Difficulty.)

Chem. & Drugg., 120, p. 72.

Discusses the nature of the precipitate formed when Solution of Ammonium Acetate is mixed with Solution of Lead Subacetate.

(Editor.)

1934.

Solution of Ammonium Acetate.

Chem. & Drugg., 120, p. 365.

Gives a method of preparing Solution of Ammonium Acetate.

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UNITED STATES PHARMACOPOEIA (O-XI)

1820 - 1930

and

NATIONAL FORMULARY (I-VI)

1886 - 1936

HISTORY

of

SOLUTION OF AMMONIUM ACETATE

U.S.P., 1820, Pp. 72 & 73.

Ammoniae Acetatis Liquidus

Liquid Acetate of Ammonia
Commonly called Spirit
of Mindererus.

Rx. Ammoniae carbonatis,
in pulverem redacti
quantum-/vis./

Take of Carbonate of am-
monia, in powder, any
quantity./

Adde paulatim et saepe a-
gitando, aceti purificati
quantum ad/ saturandum ac-
curate ammoniae carbonatem
suffecerit./

Add, by small portions, with
frequent agitation, so much
puri-/fied vinegar, as shall
be sufficient exactly to sat-
urate the carbo-/nate of am-
monia./

U.S.P., 1830, (N.Y.), Pp. 74.

Liquor Ammoniae Acetatis

Solution of Acetate of Am-
monia.

Spirit of Mindererus.

Rx. Ammoniae carbonatis,
in pulverem re-/dac-
ti, quantumvis./

Take of carbonate of ammonia
any quan-/tity./

Adde paulatim et saepe a-
gitando, aceti/ purifica-
ti quantum ad saturandum
accurate/ ammoniae car-
bonatem suffecerit./

Add, by small portions, with
frequent/ agitation, so much
purified vinegar, as shall/
be sufficient exactly to sat-
urate the carbo-/nate of am-
monia./

U.S.P., 1830, (Phil.), Pp. 60 & 61.

Spiritus Mindereri.

Rx. Acidi acetic dilu-
ti octarium, / am-
moniae carbonatis
in pulverem triti
quantum / satis sit. /

Acido ammoniae carbona-
tem paulatim adjice, a-
si- / due movens, donec
bullulae non amplius
excitentur. /

Spirit of Mindererus.

Take of diluted acetic acid
a pint, / carbonate of am-
monia, in powder, a suf- /
ficient quantity. /

Add the carbonate of ammon-
ia gradually to the / acid,
stirring constantly, until
effervescence ceases. /

U.S.P., 1840, Pp. 70.

Liquor Ammoniae Acetatis.

Solution of Acetate of Ammonia.

(Spiritus Mindereri-Spirit of Mindererus)

Take of diluted acetic acid two pints; /
Carbonate of ammonia, in powder, a / sufficient quan-
tity.

Add the carbonate of ammonia gradually to / the acid
until it is saturated.

This solution is colourless, and does not become col-
oured / by the action of sulphohydric acid. It yields no
precipitate / with nitrate of silver or chloride of barium. /

U.S.P., 1850, Pp. 81.

Liquor Ammoniae Acetatis.

Solution of Acetate of Ammonia.

(Spiritus Mindereri-Spirit of Mindererus)

Take of diluted acetic acid two pints; /

Carbonate of ammonia, in powder, a/ sufficient quantity./

Add the carbonate of ammonia gradually to/ the acid until it is saturated./

This solution is colourless, and does not become coloured/ by the action of sulphohydric acid. It yields no precipitate/ with nitrate of silver or chloride of barium./

U.S.P., 1860, Pp. 216.

Liquor Ammoniae Acetatis.

Solution of Acetate of Ammonia.

Spirit of Mindererus.

Take of diluted acetic acid two pints;/

Carbonate of ammonia a sufficient/ quantity.

Add the carbonate gradually to the acid until/ this is saturated, and filter. This preparation,/ when dispensed, should be freshly made./

A colourless liquid, which is not darkened by the action of hydro-sulphuric acid, and does not yield a precipitate with nitrate of silver/ or chloride of barium./

U.S.P., 1870, Pp. 208.

Liquor Ammonii Acetatis.

Solution of Acetate of Ammonium.

Spirit of Mindererus.

Take of diluted acetic acid two pints;/

Carbonate of ammonia a sufficient quantity./

Add the carbonate gradually to the acid until the latter is neutralized, and filter. This preparation, when/ dispensed, should be freshly made./

Solution of acetate of ammonium may be also prepared/

by mixing together the following solutions./

Take of carbonate of ammonium six hundred and forty/
grains; /

Distilled water a sufficient quantity./

Dissolve the carbonate of ammonium in twelve fluid-/
ounces of distilled water, and filter through paper, add-
ing/ a sufficient quantity of distilled water, through
the filter, / to make the solution measure a pint./

Take of acetic acid four fluidounces; /

Distilled water twelve fluidounces. /

Mix them. /

These solutions must be kept in well-stoppered bottles,
and/ mixed in equal quantities when dispensed. /

A colourless liquid, which is not darkened by the ac-
tion of hydro- / sulphuric acid, and does not yield a precip-
itate with nitrate of silver / or chloride of barium. /

U.S.P., 1880, Pp. 194.

Liquor Ammonii Acetatis.

Solution of Acetate of Ammonium.

(Spirit of Mindererus)

Diluted Acetic Acid, one hundred parts-----100

Carbonate of Ammonium, a sufficient quantity.

Add a sufficient quantity of carbonate of ammonium
gradually to the / diluted acetic acid, until it is neu-
tralized. /

This preparation should be freshly made, when required
for use. /

Solution of acetate of ammonium may also be prepared in

the following/ manner.

Carbonate of Ammonium, ten parts-----10

Acetic Acid, twenty-eight parts-----28

Distilled Water, one hundred and forty-two parts--142

Dissolve the carbonate of ammonium in eighty (80) parts of distilled/ water, and filter the solution. To the acetic acid add sixty-two (62) parts/ of distilled water. Keep the solutions in separate, well-stoppered bottles,/ and when Solution of Acetate of Ammonium is to be dispensed, weigh/ equal quantities of each solution and mix them./

A clear, colourless liquid, free from empyreuma, of a mildly saline taste, and a/ neutral or slightly acid reaction. Specific gravity 1.022. It is wholly volatilized by heat./ When heated with potassa, it evolves vapor of ammonia, and, when heated with/ sulfuric acid, it gives out vapor of acetic acid. It should not be darkened by/ hydro-sulphuric acid or sulphide of ammonium (absence of metals.) It contains about/ 7.6 percentage of acetate of ammonium./

Preparation: Mistura Ferri et Ammonii Acetatis.

U.S.P., 1890, Pp. 226 & 227.

Liquor Ammonii Acetatis.

Solution of Ammonium Acetate.

(Spirit of Mindererus.)

An aqueous solution of Ammonium Acetate ($\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$ 76.87) con-/taining about 7 per cent. of the salt, together with small amounts/ of acetic acid and carbonic acid./

Ammonium Carbonate, five grammes-----5 Gm.

Diluted Acetic Acid, one hundred cubic centimeters

100 cc

Add the ammonium carbonate (which should be in translucent/ pieces, free from white, pulverulent bicarbonate) gradually to the/ cold diluted acetic acid, and stir until it is dissolved./

This preparation should be freshly made when wanted./

A clear, colourless liquid, free from empyreuma, of a mildly saline, acidulous/ taste, and an acid reaction./

It is wholly volatilized by heat./

When Solution of Acetate of Ammonium is heated with potassium or sodium/ hydrate, vapor of ammonia is evolved./

When heated with sulfuric acid, the Solution gives off vapor of acetic acid./

Preparation: Liquor Ferri et Ammonii Acetatis./

U.S.P., 1900, Pp. 258.

Liquor Ammonii Acetatis.

Solution of Ammonium Acetate.

An aqueous solution which should contain not less than 7 per cent/ of Ammonium Acetate ($\text{CH}_3\text{COONH}_4$, 76.51), with small amounts/ of acetic and carbonic acids./

Ammonium Carbonate, five grammes-----5 Gm.

Diluted Acetic Acid, one hundred cubic centimeters

100 cc

Add the ammonium carbonate (which should be in translucent/ pieces, free from white, pulverulent bicarbonate) gradually to the/ cold diluted acetic acid, and stir until it is dissolved./

This preparation should be freshly made when wanted./

A clear, colorless liquid, free from empyreuma, of a mildly saline, acidulous/ taste, and an acid reaction./

It is wholly volatilized by heat./

When Solution of Ammonium Acetate is heated with potassium hydroxide/ T.S., ammonia is evolved./

If to five cc. of the solution one cc. each of sulfuric acid and alcohol/ be added, and the mixture boiled, the odor of acetic acid will be developed./

Average dose.----16cc (4 fluidrachms.)

U.S.P., 1910, Pp. 237.

Liquor Ammoniae Acetatis.

Solution of Ammonium Acetate.

Liq. Ammon. Acet.---Spirit of Mindererus.

An aqueous solution containing N.L.T. 7% of $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$ / (77.07), with small amounts of acetic acid and carbonic acids./

Ammonium Carbonate, 5 grammes-----5 Gm.

Diluted Acetic Acid, 100 milliliters-----100 mils.

Add the ammonium carbonate (which must be in hard, translucent/ pieces) gradually to the cold diluted acetic acid, and stir until it is/ dissolved.

This preparation must not be dispensed unless it has been recently/ prepared.

Solution of Ammonium Acetate is a clear, colorless liquid free from empy-/reumatic odor and having a mildly saline, acidulous taste, and an acid reaction./

It is volatile when heated. Not more than 0.003 Gm. of

ash remains on evap-/orating 20 mils of the solution and igniting the residue./

When Solution of Ammonium Acetate is heated with KOH/ T.S., ammonia is evolved.

Add 1 mil each of sulfuric acid and alcohol to 5 mils of the solution/ and boil the mixture; ethyl acetate is formed, recognizable by its odor./

Assay--Dilute about 25 mils of Solution of Ammonium Acetate, accurately/ weighed, with 100 mils of distilled water, transfer it to a distilling flask, render/ it alkaline with KOH T.S. and distil the liquid until all of the/ ammonia has been driven over (about 100 mils of distillate) receiving the/ distillate under the surface of 50 mils of of normal sulfuric acid V.S. contained/ in a flask. Then titrate with normal potassium hydroxide V.S., using methyl/ orange T.S. as indicator. It shows not less than 7% of NH C H O ./

Each mil of normal sulfuric acid V.S. used corresponds to 0.07707 Gm. of/ $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$. Each gramme of Solution of Ammonium Acetate corresponds to/ not less than 0.91 mil of normal sulfuric acid V.S./

Preparation:-Liquor Ferri et Ammonii Acetatis./

Average dose--Metric, 15 mils--Apothecaries, 4 fluid-
rachms./

U.S.P., 1920, Pp. 207.

Liquor Ammoniae Acetatis.

Solution of Ammonium Acetate.

Liq. Ammon. Acet.---Spirit of Mindererus.

Solution of Ammonium Acetate contains, in each 100 cc, not less/ than 6.5 Gm. and not more than 7.5 Gm. of $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$ with small/ amounts of acetic and carbonic acids./

Caution---Only a recently prepared Solution of Ammonium Acetate/ should be dispensed./

Ammonium Carbonate, in hard, translucent pieces----5 Gm.

Diluted Acetic Acid-----100 cc.

Dissolve the ammonium carbonate in the diluted acetic acid without/ strong agitation./

Solution of Ammonium Acetate may also be prepared as follows:

Solution No. 1.

Ammonium Carbonate, in hard, translucent pieces---50 Gm.

Distilled Water, a sufficient quantity,

To make-----500 cc.

Solution No. 2.

Acetic Acid-----160 cc.

Distilled Water, a sufficient quantity,

To make-----500 cc.

Cautiously mix the two solutions in equal volumes in a capacious/ vessel, in quantities sufficient to produce the amount of Solution of/ Ammonium Acetate needed./

Description and physical properties.---A clear, colorless liquid, free from empyreu-/matic odor. It has a mildly saline, acidulous taste, and an acid reaction./

Test for identity.---Solution of Ammonium Acetate responds to the reactions for/ ammonia, page 440, and for acetates, page 440./

Test for purity.---Not more than 0.003 Gm. of ash remains on evaporating 20 cc/ of the solution and igniting the residue./

Assay.---Transfer 25 cc. of Solution of Ammonium Acetate to a distilling flask/ dilute with 100 cc of distilled water, add 25 cc of ten per cent sodium hydroxide/ solution, and distill the liquid until all of the ammonia has been driven over/ (about 100 cc of distillate), receiving the distillate under the surface of 50 cc/ of normal sulfuric acid contained in a flask. Titrate the excess of acid with/ normal sodium hydroxide, using methyl orange T.S. as indicator. Each cc/ of normal sulfuric acid corresponds to 0.07707 Gm. of $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$./

Preparation---Liquor Ferri et Ammoniae Acetatis.

Average dose.---Metric, 15 cc.---Apothecaries, 4 fluidrachms.

U.S.P., 1930, Pp. 204.

Liquor Ammonii Acetatis.

Solution of Ammonium Acetate.

Liq. Ammon. Acet.

Solution of Ammonium Acetate contains, in each 100 cc., not less/ than 6.5 Gm. and not more than 7.5 Gm. of $\text{CH}_3\text{COO}\cdot\text{NH}_4$ with/ small amounts of acetic acid and carbonic acids./

Caution.---Only a recently prepared Solution of Ammonium Acetate/ should be dispensed.

Ammonium Carbonate, in hard, translucent pieces---5 Gm.

Diluted Acetic Acid-----100 cc.

Dissolve the ammonium carbonate in the diluted acetic

acid without/ strong agitation./

Solution of Ammonium Acetate may also be prepared as follows:-

Solution No. 1.

Ammonium Carbonate, in hard, translucent pieces---50 Gm.

Distilled Water, a sufficient quantity,

To make-----500 cc.

Solution No. 2.

Acetic Acid-----160 cc.

Distilled Water, a sufficient quantity,

To make-----500 cc.

Cautiously mix the two solutions in equal volumes in a capacious/ vessel, in quantities sufficient to produce the amount of Solution of/ Ammonium Acetate needed./

Description and physical properties---A clear, colourless liquid, free from empyreu-/matic odor. It has a mildly saline, acidulous taste, and an acid reaction to/ litmus paper./

Tests for identity---Solution of Ammonium Acetate responds to the tests for/ ammonium, page 448, and for acetate page 448./

Tests for purity---Not more than 0.003 Gm. of ash remains on evaporating 20 cc./ of the solution and igniting the residue./

Assay---Transfer 25 cc. of Solution of Ammonium Acetate to a distilling flask,/ dilute with 75 cc. of distilled water, add 50 cc. of sodium hydroxide T.S.,/ and distil the liquid until all of the ammonia has been driven over (about

100 cc of distillate), receiving the distillate under the surface of 50 cc of normal sulfuric acid contained in a flask. Titrate the excess of acid with normal sodium hydroxide, using methyl red T.S. as the indicator./ Each cc of normal sulfuric acid is equivalent to 0.07706 Gm. of $\text{CH}_3\text{COO}\cdot\text{NH}_4$./

Average dose.---Metric, 15 cc.---Apothecaries, 4 fluidrachms.

SUMMARY OF U.S.P. & N.F. DATA

of

Solution of Ammonium Acetate.

Official in:

U.S.P., 1820, '30(N.Y.), '30(Phil.), '40, '50, '60,
'70, '80, '90, 1900, '10, '20, '30.

Official Latin Title:

Ammoniae Acetatis Liquidus, U.S.P., 1820.

Liquor Ammoniae Acetatis, U.S.P., '30(N.Y.), '30
(Phil.), '40, '50, '60, 1910, '20.

Liquor Ammonii Acetatis, U.S.P., 1870, '80, '90,
1900, '30.

Official English Title:

Liquid Acetate of Ammonia, U.S.P., 1820.

Solution of Acetate of Ammonia, U.S.P., '30(N.Y.),
'30(Phil.), '40, '50, '60, '70, '80.

Solution of Ammonium Acetate, U.S.P., '90, 1900,
'10, '20, '30.

Official Abbreviation:

Liq. Ammon. Acet., U.S.P., 1910, '20, '30.

Official Synonym:

Spirit of Mindererus, U.S.P., 1820, '30(N.Y.), '30
(Phil.), '40, '50, '60, '70, '80, '90, 1910,
'20.

Official Formula:

$\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$, U.S.P., 1890, 1910, '20.

$\text{CH}_3\text{COONH}_4$, U.S.P., 1900, '30.

Official Description:

An aqueous solution of Ammonium Acetate ($\text{NH}_4\text{C}_2\text{H}_3\text{O}_2 = 76.87$), containing about 7% of the salt, together with small amounts of acetic acid and carbonic acid, U.S.P., 1890, 1900, '10.

Solution of Ammonium Acetate contains, in each 100 cc, not less than 6.5 Gm. and not more than 7.5 Gm. of $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$, with small amounts of acetic and carbonic acids, U.S.P., 1920, '30.

Official Preparation:

Mistura Ferri et Ammonii Acetatis, U.S.P. 1880.

Liquor Ferri et Ammonii Acetatis, U.S.P., 1890, '10,
'20.

Official Dose:

16 cc. (4 fluidrachms), U.S.P., 1900.

Metric, 15 mils. Apothecaries, 4 fluidrachms, U.S.P.,
1910.

Metric, 15 cc. Apothecaries, 4 fluidrachms, U.S.P.,
1920, '30.

APPROVED BY W. O. Richtmann
Prof. of Pharmacognosy
June 7, 1940