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SILVER IODIDE

PHARMACEUTICAL PREPARATIONS AND USES

BY

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Synonyms

- |                      |                           |
|----------------------|---------------------------|
| 1. Argenti Iodidum   | 13. Iodargerite           |
| 2. Argentum Iodatum  | 14. Jodit                 |
| 3. Silver Iodide     | 15. Jod silber            |
| 4. Iodide of Silver  | 16. Plata cornea amarilla |
| 5. Iodyrite          | 17. Silver Iodobromide    |
| 6. Iodargyre         | 18. Silber Jodid          |
| 7. Iodargyrite       | 19. Neo Silvol            |
| 8. Iodic Silver      | 20. Argenticum Iodidum    |
| 9. Iodin Silver      | 21. Ioduro de Plata       |
| 10. Iodite           | 22. Jodsilfer             |
| 11. Iodsilber        | 23. Silfverjodid          |
| 12. Iodure d- argent |                           |

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A Companion to the U.S.P. Oldberg & Wall 1884  
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Occurrence and Preparation

Silver iodide occurs as Iodargyrite in Mexico, Chile, Spain, and in the Cerro Colorado Mine,<sup>1</sup> and in Arizona<sup>2</sup> in the form of slightly elastic hexagonal prisms.

Silver iodide may be prepared by various methods according to different authors:

Silver and Iodine combine directly on heating.<sup>3</sup>

Silver dissolves in hydroiodic acid with a violent evolution of hydrogen. If action slows up it will again become violent upon heating and on cooling colorless crystals separate out.<sup>4</sup>

Silver iodide is prepared also by double decomposition between solution of potassium iodide and silver nitrate.<sup>5</sup>

Silver iodide may occur as a pale yellow precipitate caused by the solution of silver in hydriodic acid or solutions of the iodides.<sup>6</sup>

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3. Roscoe and Schorlemer - A Treatise on Chem. Ed. 6

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U. S. Dispensatory.

Editions 9, 10, 11, 12, 13, 14.

Felter and Lloyd - Kings American Disp. Ed. 18

Johnson - A Medical Formulary.

The National Disp.

Editions 3, 5.

Fenner - Fenner's Complete Formulary. Ed. 6

Simon - Manual of Chemistry.

Sadtler and Trimble - A Textbook of Chemistry.

The Dispensatory of the U.S. of A. Ed. 19

Wood and Remington - The Disp. of the U.S. of A. Ed. 20

6. Parrish - A Treatise on Pharmacy.

Editions 4, 5.

Properties

Silver iodide is a heavy amorphous, light-yellowish powder, unaltered by light if pure but usually becoming somewhat greenish yellow.<sup>1</sup> It is odorless and tasteless.

It is insoluble in water, alcohol, dilute acids and a solution of ammonium carbonate,<sup>2</sup> but is soluble 1-2500 in solutions of ammonia.<sup>3</sup> A strong solution of potassium iodide will readily dissolve silver iodide,<sup>4</sup> but it will be precipitated when water is added; it is also soluble in a solution of potassium cyanide.<sup>5</sup>

Specific gravity - Mass variety - 5.687 at 0°C<sup>6</sup>

Specific gravity - Crystalline variety - 5.669 at 9°C

Specific gravity - precipitated variety - 5.596 at 0°C

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The National Dispensatory Ed. 3

Sadtler and Trimble - A Textbook of Chemistry.

Squire - A Companion to the Latest British Pharmacopoeia  
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6. Roscoe and Schorlemer - A Treatise on Chem. Ed. 6

Behavior to Light

Silver iodide is a colorless or pale yellow powder which, if pure, is unaltered by light;<sup>1</sup> however, most silver iodide will turn more of a greenish yellow when exposed to sunlight. This green color is more plainly noticed on silver iodide which has been crystallized from a silver nitrate solution so that some of the latter salt may perhaps have been carried down with the precipitate. In this case on long exposure the green color turns to a black color, but no free iodine is liberated.<sup>2</sup>

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1. Parrish - A Treatise on Pharmacy. Ed. 5  
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 Ed. 17, 19.  
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  2. Roscoe and Schorlemer - A Treatise on Chem. Ed. 6

Effect of Heat

Silver iodide seems to react differently to heat under varying conditions of experimentation according to various reports. Probably its queerest reaction to heat is that, according to M. Fizeau, it contracts on heating and expands on cooling.<sup>1</sup> The experiments of M. Fizeau are to a certain degree verified by Jones<sup>2</sup> who says that the affinity of the elements for each other increases with heat and therefore the volume would be diminished.

The melting point of silver iodide also seems to vary. According to Deville it is dimorphous, melting at 556° C to a yellow liquid, which on further heating turns to a yellow-brown, red, or dark brown color. On cooling a yellow soft mass is formed.<sup>3</sup> However, other authors are content to say that the compound melts around 400° C to form a dark red liquid which on cooling congeals to a soft, yellow, slightly translucent mass.<sup>4</sup>

Silver Iodide fuses at a low red heat to assume a reddish color.<sup>5</sup>

When strongly heated with a blow pipe on charcoal it burns with a green flame and white smoke leaving a residue of silver.<sup>6</sup>

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1, 2, 3 - Roscoe and Schorlemer - A Treatise on Chem. Ed. 6

4. The U. S. Dispensatory

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5. King - The American Dispensatory. Ed. 6, 8.

6. Felter and Lloyd - King's American Disp. Ed. 18

Reaction to Reagents

Ammonia changes silver iodide from a yellow color to white. Washing with water restores the yellow color.<sup>1</sup>

If an aqueous solution of silver iodide in ammonia is allowed to evaporate at  $-40^{\circ}$  to  $-10^{\circ}\text{C}$  white crystals of  $2 \text{ AgI} \cdot \text{NH}_3$  form, which product also forms by the action of ammonia gas on dry precipitated silver iodide.<sup>2</sup>

A hot solution of potassium iodide when saturated with silver iodide deposits white crystals of  $\text{AgI} \cdot \text{KI}$  when allowed to stand.<sup>3</sup>

When silver iodide is treated with chlorine silver chloride forms and iodine is liberated. The same reaction occurs when silver iodide is treated with dry hydrogen chloride at  $700^{\circ}\text{C}$  according to the experiments of Hautfeulle<sup>4</sup>

Silver iodide is only incompletely reduced in a current of hydrogen, even at white heat (Vogel).<sup>5</sup>

An aqueous solution of potassium iodide when saturated with silver iodide yields a black precipitate to hydrogen sulfide or ammonium sulfide test solution.<sup>6</sup> A solution in potassium cyanide produces the same results.<sup>7</sup>

If a small quantity of chlorine water be agitated with an excess of the salt, the filtrate turns blue on the addition of starch test solution.<sup>8</sup>

When .5 grams of the salt are digested with 10 c.c. of cold 15% ammonium carbonate solution and the filtrate acidified with nitric acid, it should become no more than faintly

opalescent. (Absence of chlorides).<sup>9</sup>

When a portion of the salt free from chlorides (or freed of chlorides) is digested for 5 minutes with 10 c.c. of ammonia water and to the filtrate is added a little nitric acid, only a slight opalescence but no yellow precipitate forms (absence of bromide.)<sup>10</sup>

Silver iodide is easily decomposed when heated with potassa.<sup>11</sup>

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1. Roscoe and Schorlemer - A Treatise on Chem. Ed. 6

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6. The United States Dispensatory Ed. 17

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Parrish - A Treatise of Pharmacy Ed. 5

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The Nat'l. Disp. Ed. 5

9. The U. S. Disp. Editions 17, 19.  
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Editions 17, 19.  
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The Nat'l. Disp. Ed. 3 P. 257
11. King - The American Dispensatory. Ed. 8. P. 1265.

Therepeutic Properties

The therepeutic history of silver iodide centers around Dr. C. Patterson, a physician of Dublin Ireland at about 1870. He found its properties to coincide quite closely with those of silver nitrate, but he observed that it does not discolor the skin as does the latter. In the last observation he is probably in error.<sup>1</sup> He found it to be successful in curing stomach disorders of the Irish peasantry, whooping cough, dysmemorrhœa, but its use for epilepsy was less effective.<sup>2</sup>

Silver Iodide is also used in place of silver chloride when the modified effect of the iodine is desirable.<sup>3</sup>

At present it has almost gone out of use. It is still used to some extent for whooping cough, asthma, chorea, vicerol, neuralgia, and syphillis.<sup>4</sup>

It is often now injected in a suspension in cases of gonorrhœal urethritis.<sup>5</sup>

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The Nat'l. Disp. Ed. 3.
5. The Disp. of the U.S. Ed. 20

Preparations

The following preparations of silver iodide are listed in Pharmaceutical literature.

Ointment of Silver Iodide

Griffeth - A Universal Formulary used similarly to the ointment of Silver cyanide.

Suspension of Silver Iodide.

American Journal of Pharmacy V. 78

Suspension of Silver Iodide.

American Journal of Pharmacy V. 78

Emulsion of Silver Iodide

Druggist Circular V. 57

Neo Silvol

New and Non Official Remedies - 1927-1932

Emulsion of Silver Iodide.

Woolley }  
Forrester } Pharmaceutical Formulas Ed. 10

Suspension of Silver Iodide

The Pharmaceutical Recipe Book P. 149

Soluble Silver Iodide

Woolley }  
Forrester } Pharmaceutical Formulas Ed. 10

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Editions 9----	1851	14----	1879
10----	1854	17----	1903
11----	1858	19----	1907
12----	1865	20----	1918
13----	1870		

## The American Dispensatory

Editions 6----	1864
8----	1872
18----	1898

A Universal Formulay by R. E. Griffeth, 1866

A Treatise on Pharmacy

By E. Parrish, Editions 4----	1874
5----	1884

A Medical Formulay by L. Johnson--1881

The United States Pharmacopoeia--1880-1890

A Companion to the U.S.P. by Oldberg and Wall, 1884

The National Dispensatory--Edition 3, 1884  
5, 1894

The Practice of Pharmacy by J. P. Remington,  
1886

Edition 2---1893

Edition 3---1894

Edition 4----

Edition 7----1926

Fenner's Complete Formulay by B. Fenner--1888

Chemistry:--General, Medical, and Pharmaceutical

By J. Attfield, Edition 12, 1889.

A Manual of Chemistry

By W. Simon, 1891

A Textbook of Chemistry

By S. P. Sadtler and H. Trimble, 1895

Companion to the Latest British Pharmacopoeia

By P. W. Squire, Ed. 19, 1916

A Treatise on Chemistry

By H. E. Roscoe and C. Schorlemer, Ed. 6, 1923.

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By The Amer. Medical Association, 1927,1928,1929,1930,  
1931,1932.

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By S. W. Woolley and G. P. Forrester, Edition 10, 1929

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- Wilbert, M. I. 1906  
Nascent Silver Iodide  
Am. Jr. Pharm. 78, 64  
(The Pharm. Era., 35, p. 267; Drugg. Circ. 50, P. 126)  
An article giving method for preparing nascent silver iodide, its properties, and methods for its preservation.  
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- Thum, J. K. 1910  
Am. Jr. Pharm., 78, p. 507  
(Pharm. Jr. and Transact., 85, p. 767)  
An article giving the results of experimentation with various suspending agents for preparing a suspension of silver iodide, and the reaction of the various suspensions to shaking and attempted separation. Describes the suspension when examined microscopically.  
- - - - -
- B. 1913  
Emulsion of Silver Iodide  
Drugg. Circ., 57, p. 205  
A formula for preparing an emulsion of silver iodide, and methods of purifying the precipitated silver iodide.  
- - - - -

Thum, J. K.

1915

So-Called saturated solution of silver iodide.

Amer. Jr. of Pharm. 87, P. 500

Describes a produce for making quick solution of Silver Iodide, giving composition, formula for preparing, and uses.

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Bowler, A. D.

1926

Silver Iodide - Neo Silvol

The Northwest. Drug., 34

Neo-Silvol a product now on the market, is soluble in water and quite commonly prescribed as a germicide.

APPROVED Nellie Wakeman  
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