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A Bibliography of Sources of Experimental Data Leading to Activity or Osmotic Coefficients for Polyvalent Electrolytes in Aqueous Solution

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A Bibliography of Sources of Experimental Data Leading to Activity or Osmotic Coefficients for Polyvalent Electrolytes in Aqueous Solution

6. SPECIAL PUBLICATION # 485

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Foreword

The National Standard Reference Data System was established in 1963 for the purpose of promoting the critical evaluation and dissemination of numerical data of the physical sciences. The program is coordinated by the Office of Standard Reference Data of the National Bureau of Standards, but involves the efforts of many groups in universities, government laboratories, and private industry. The primary aim of the program is to provide compilations of critically evaluated physical and chemical property data. These tables are published in the *Journal of Physical and Chemical Reference Data*, in the NSRDS-NBS series of the National Bureau of Standards, and through other appropriate channels.

The task of critical evaluation is carried out in various data centers, each with a well-defined, technical scope. A necessary preliminary step to the critical evaluation process is the retrieval from the world scientific literature of all papers falling into the scope of the center. Each center, therefore, builds up a comprehensive, well-indexed bibliographical file which forms the base for the evaluation task. Bibliographies derived from these files are published when they appear to be of value to research workers and others interested in the particular technical or programmatic area.

The present bibliography covers experimental measurements that lead to activity and/or osmotic coefficients for polyvalent electrolytes in water. It forms part of the program whose ultimate objective is to provide compilations of reliable data on aqueous electrolytes for application to problems in water pollution, chemical process design, and other areas.

Further information on NSRDS and the publications which form the primary output of the program may be obtained by writing to the Office of Standard Reference Data, National Bureau of Standards, Washington, D.C. 20234.

David R. Lide, Jr., Chief
Office of Standard Reference Data

A Bibliography of Sources of Experimental Data Leading to Activity
or Osmotic Coefficients for Polyvalent Electrolytes in Aqueous Solution

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Contained herein is a bibliography of sources of experimental data that can be used to calculate either activity or osmotic coefficients in water. The data types included are electromotive force measurements on cells with and without transference, vapor pressure data (relative and absolute), ultracentrifuge measurements, diffusion measurements, and other miscellaneous techniques. The compounds are given according to the standard thermochemical order of arrangement and references to the primary literature are included.

Key Words: Activity coefficients; aqueous systems; bibliography; electro-chemistry; isopiestic; osmotic coefficients; thermochemistry; vapor pressure.

Introduction

The object of this bibliography is to locate in the scientific literature data from experimental measurements that lead to activity and/or osmotic coefficients for polyvalent electrolytes in water. Our motivation for undertaking this task arises from our need to locate these sources of data as a necessary step prior to subjecting the data to a more detailed analysis leading to evaluated activity and osmotic coefficients. We refer the reader to references [1,2,3] for a description of the evaluation procedures we have used.

The types of data with which we are concerned and the abbreviations we will use to designate them are as follows:

<u>Data Type</u>	<u>Abbreviation</u>
Isopiestic measurements	VI
Vapor pressure measurements - dynamic and static	VP
Freezing point depression measurements	FP
Boiling point elevation measurements	BP
Electrochemical cell measurements	
A. Without transference	E
B. With transference	ET
Diffusion measurements (on very dilute solutions only)	D
Ultracentrifuge measurements	U
Solvent extraction techniques	SE
Vapor pressure osmometry	VPO

We have arranged the various compounds according to the standard order of arrangement [4] (see fig. 1) and for each compound we list the appropriate references and the abbreviation for the data types to be found in that reference.

We have specifically excluded from this bibliographic coverage the following: (1) data on uni-univalent electrolytes; (2) data on mixed electrolyte systems; and (3) data on polymers. We refer the reader to the review of Hamer and Wu [5] for evaluated activity and osmotic coefficients for uni-univalent electrolytes and to the bibliography given in the book by Harned and Robinson [6] for sources of data on mixed electrolyte systems. The classic monographs of Harned and Owen [7] and of Robinson and Stokes [8] still remain useful sources of data; the recent evaluations of Pitzer and Mayorga [9, 10] are also of particular interest.

Our literature search encompassed the following: (1) a search of the files of the Chemical Thermodynamic and Electrolyte Data Centers at the National Bureau of Standards; (2) a computer search of Chemical Abstracts (from Volumes 76 to 85) and the National Technical Information Services (from 1964 to 1976); (3) a search of the annual indexes (from 1950 to 1976) of the list of journals given in Table 1; (4) a search of several pertinent reviews and compilations [11-19]; and (5) a search of the appropriate citations given in the papers located *via* procedures (1) to (4) above. The scientific literature is so very large and diverse that we probably have missed some data sources. We would appreciate it if any readers who find any citations missing or in error could bring such items to our attention.

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Table 1. Journals that have been searched for sources of relevant data.

J. Am. Chem. Soc.

J. Chem. Eng. Data

J. Chem. Soc.

J. Chem. Thermodyn.

J. Phys. Chem.

J. Solution Chem.

Russ. J. Phys. Chem. (English Translation of Zh. Fiz. Khim.)

Russ. J. Inorg. Chem. (English Translation of Zh. Neorg. Khim.)

Trans. Faraday Soc.



Figure 1. The compounds are entered according to the Standard Order of Arrangement [4] by the principle of latest position. In this scheme, a compound is listed under the element occurring latest in the list. Within the table for a given element will be found all of the compounds of that element with elements occurring earlier in the order. An exception occurs for carbon compounds which are divided into subgroups consisting of all compounds with one carbon atom, then all with two carbon atoms, etc.

H₂SO₄

- Abel (1946) (review)
 Äkerlof (1926) - E
 Beck, Dobson and Wynne-Jones (1960) - E
 Beck, Singh and Wynne-Jones (1959) - E
 Bedford (1909) - FP
 Berkeley, Hartley and Burton (1919) - VP
 Biltz (1902) - FP
 Brönsted (1910) - E
 Burt (1904) - VP
 Collins (1933) - VP
 Covington, Dobson and Wynne-Jones (1965) - E
 Daudt (1923) - VP
 Dieterici (1893) - VI
 Dieterici (1897) - VP
 Drucker (1920) - ET
 Ferguson and France (1921) - ET
 Glueckauf and Kitt (1956) - VP
 Grollman and Frazer (1925) - VP
 Hacker (1912) - VP
 Hamer (1935) - E
 Harned and Hamer (1935) - E
 Hausrath (1902) - FP
 Hepburn (1928) - VP
 Hornung and Giauque (1955) - E
 Jones, (1893b) - FP
 Jones et al. (1907) - FP
 Jones (1951) - VP
 Jones and Getman (1902) - FP
 Jones and Getman (1904) - FP
 Jones and Pearce (1907) - FP
 Kunzler and Giauque (1952) - FP
 Lewis and Lacey (1914) - E
 Lilley and Briggs (1975) - (review)
 Loomis (1893) - FP
 Loomis (1894a) - FP
 Loomis (1894b) - FP
 MacDougall and Blumer (1933) - E
 McHaffie (1927) - VP
 Meyeren (1932) - V
 Ponsot (1897) - FP
 Pickering (1891) - FP
 Pickering (1892) - FP
 Platford (1973) - VI
 Randall and Cushman (1918) - E
 Randall and Scott (1927) - FP
 Rard, Habenschuss, and Spedding (1976) - review
 Rard and Spedding (1977) - VI
 Robinson (1939) - VI
 Robinson (1945) - VI
 Roth (1960) - FP
 Roth and Knothe (1960) - FP
 Scatchard, Hamer and Wood (1938) - VI
 Shankman and Gordon (1939) - VP
 Sheffer et al. (1939) - VI
 Shrawder and Cowperthwaite (1934) - E
 Stokes (1945b) - VI
 Stokes (1947) - VB
 Tartar et al. (1941) - V, E
 Trimble and Ebert (1933) - E
 Vosburgh and Craig (1929) - E

(NH₄)₂ SO₄

- de Coppet (1904) - FP
 Edgar and Swan (1922) - VP
 Jones and Getman (1904) - FP
 Jones et al. (1907) - FP
 Scatchard and Prentiss (1932) - FP
 Sircar et al. (1961) - ET
 Wexler and Hasegawa (1954) - VP
 Wishaw and Stokes (1954) - VI

H₂PO₃

- Nylen and Stelling (1933) - FP

H₃PO₄

Biltz (1902) - FP

Chambers and Frazer (1900) - FP

Dieterici (1893) - VI

Elmore, Mason and Chritensen (1946) - VI

Jones (1893b) - FP

Jones and Getman (1903) - FP

Jones and Getman (1904) - FP

Jones et al. (1907) - FP

Kablukov and Zagwosdkin (1935) - VP

Kerker and Espenscheid (1958) - ET

Larson (1950) - E

Loomis (1893) - FP

Loomis (1894a) - FP

Loomis (1894b) - FP

Loomis (1896a) - FP

Loomis (1896b) - FP

Loomis (1897b) - FP

Loomis (1897a) - FP

Loomis (1897b) - FP

Mason and Blum (1947) - E

Mason and Culvern (1949) - ET

Platford (1975) - VI, FP

Platford (1976) - VI

(NH₄)₂ HPO₄

Platford (1974) - VI

H₂As₂O₄

Roth and Schwartz (1926) - FP

C₄H₄O₄ (maleic acid)

Robinson, Smith and Smith (1942) - VI

C₄H₆O₄ (succinic acid)

Robinson, Smith and Smith (1942) - VI

C₄H₆O₅ (maleic acid)

Robinson, Smith and Smith (1942) - VI

C₄H₆O₆ (d-tartaric acid)

Robinson, Smith and Smith (1942) - VI

C₄H₆O₆ (meso-tartaric acid)

Robinson, Smith and Smith (1942) - VI

C₆H₆O₆S₂ (m-benzene disulfonic acid)

Bonner, Holland and Smith (1956) - VI

Bonner and Rogers (1961) - VPO

(C₃N₂H₄)₂CO₃ (guanadinium carbonate)

Bonner (1976) - VI

(C₁₆H₂₇N₂)(C₆H₄S₂O₆) (ethylene bis (trimethylammonium m-benzene disulfonate)

Bonner and Kim (1969) - VPO

(C₁₆H₂₇N₂)SO₄ (ethylene bis (trimethylammonium sulfate)

Bonner and Kim (1969) - VPO

C₁₄H₈S₂O₈ (anthraquinone 2,7 disulfonic acid)

Bonner, Rushing and Torres (1968) - VPO

C₁₄H₁₄S₂O₆ (bibenzyl 4,4'-disulfonic acid)

Bonner, Holland and Smith (1956) - VI

Bonner and Rogers (1961) - VPO

(C₃₀H₄₁N₂S₂O₆) (ethylene bis(trimethylammonium)
4,4'-bibenzyl disulfonate)

Bonner and Kim (1969) - VP0

C₂₀H₂₆S₂O₆ (1,8-diphenyloctanedisulfonic acid)

Bonner and Rogers (1961) - VP0

C₂₁H₁₇S₃O₉ (1,2,3-triphenylpropanetrissulfonic acid)

Bonner and Overton (1963) - VI

C₂₃H₂₄S₃O₉ (1,3,5-triphenylpentane
trisulfonic acid)

Bonner and Overton (1963) - VI

C₂₆H₃₈S₂O₆ (1,14-diphenyltetradecane
disulfonic acid)

Bonner and Rogers (1961) - VP0

H₂GeO₃

Roth and Schwartz (1926) - FP

SnCl₄

Loomis (1897a) - FP

Loomis (1897b) - FP

SnI₂

Jones and Getman (1903) - FP

PbCl₂

Allmand and Hunter (1928) - E

Carmody (1929) - E

Garrels and Gucker (1949) - E

Hannan (1936) - E

Parton, Robinson and Metson (1939) - VI

Pb(ClO₄)₂

Biggs, Parton and Robinson (1955) - VI

Pb(NO₃)₂

Biggs, Parton and Robinson (1955) - VI

Conrad (1903) - ET

Hausrath (1902) - FP

Motornaya et al. (1969) - VI

Motornaya and Ben'yash (1973) - VI

Plake (1935) - BP

Randall and Vaneslow (1924) - FP

Ratner (1937) - VP

H₃BO₃

Kahlenberg (1901) - BP

Menzel (1923) - FP

Menzel (1927a) - FP

Platford (1969) - VI

(NH₄)₂ B₁₀H₁₀

Wen and Chen (1975) - VI

AlCl₃

Fricke and Havestadt (1927) - VP

Jones et al. (1907) - FP

Jones and Pearce (1907) - FP

Jones and Getman (1904) - FP

Mason (1938) - VI

Villaseca and Herrera (1944) - ET

Al(ClO₃)₃

Roth (1923) - FP

AlBr₃

Biltz (1902) - VP

Al₂(SO₄)₃

Burge (1963) - VO
Jones et al. (1907) - FP
Jones and Getman (1904) - FP
Robinson (1937) - VI
Villaseca and Herrera (1944) - ET

Al(NO₃)₃

Jones et al. (1907) - FP
Jones and Getman (1904) - FP
Pearce (1936) - VP
Pearce and Blackman (1935) - VP

Ga(ClO₄)₃

Patterson, Tyree and Knox (1955) - VI
Patterson and Tyree (1957) - VI

InCl₃

Campbell (1974) - E
Campbell et al. (1974) - FP
Covington et al. (1963) - E

In₂(SO₄)₃

Covington, Hakeem and Wynne-Jones (1963) - E
Hattox and DeVries (1936) - E
Lietzke and Stoughton (1956) - E

Tl₂SO₄

Creeth (1960) - E
Drucker (1920) - FP

ZnF₂

Cook, Davies and Staveley (1971) - E

ZnCl₂

Brüll (1934) - E
Chambers and Frazer (1900) - FP
Egan and Partington (1943) - E
Foxton and Shutt (1927) - ET, E
Fricke and Havestadt (1927) - VP
Harris and Parton (1940) - E, ET
Horsch (1919) - E
Ishikawa and Takai (1937) - E
Jones (1893a) - FP
Jones et al. (1907) - FP
Jones and Getman (1903) - FP
Lehfeldt (1900) - E, ET
Lutfullah et al. (1976) - E
Masaki (1932) - ET
Pan (1966) - VI
Robinson and Stokes (1940b) - E
Scatchard and Tefft (1930) - E
Stokes (1948) - VI

Zn(ClO₄)₂

Libus and Sadowska (1970) - VI
Lilich et al. (1975) - VI
Sircar and Prasad (1954) - ET
Stokes and Levien (1946a) - VI

ZnBr₂

Acheson (1965) - VP
Egan and Partington (1943) - E
Ishikawa et al. (1936) - VP, E
Parton and Mitchell (1939) - E
Stokes and Stokes (1945) - ET
Stokes, Stokes and Robinson (1944) - VI

ZnI₂

Bates (1938) - E
Egan and Partington (1943) - E
Partington and Torto (1948) - E
Stokes (1945a) - VI
Stokes and Levien (1946b) - VI, ET

Zn(NO₃)₂

Dieterici (1923) - VP
Ewing and Fisher (1937) - VP
Jones et al. (1907) - FP
Motornaya et al. (1969) - VI
Stokes and Levien (1946a) - VI
Yakimov and Guzhavina (1971) - VP

ZnSO₄

Albright and Miller (1975) - D
Arvia (1955) - E
Bray (1927) - E
Brown and Prue (1955) - FP
Cowperthwaite and La Mer (1931) - E
Dieterici (1923) - VP
Hass and Jellinek (1932) - ET
Hausrath (1902) - FP
Herrera et al. (1944) - E
Jones et al. (1907) - FP
Kahlenberg (1901) - BP, FP
Kangro and Groeneveld (1962) - VP
Kielland (1936) - E
Klein and Svanberg (1920) - FP
Kopecky and Dymes (1972) - VPO
La Mer and Cowperthwaite (1933) - E
Lang and King (1954) - ET
Lehfeldt (1900) - E, ET
Masaki (1932) - E
Oikova et al. (1976) - VI
Ojkova et al. (1974) - VI
Plake (1935) - BP
Purser and Stokes (1951) - ET
Rassaiah (1965) - E
Robinson and Jones (1936) - VI
Tartar et al. (1941) - VP, E
Wolten and King (1949) - VP, E

Zn C₆H₄S₂O₆ (zinc m-benzene disulfonate)

Brubaker and Rasmussen (1963) - VI

Bonner, Rushing and Torres (1968) - VP0

Zn (C₇H₇O₃S)₂ (zinc p-toluene sulfonate)

Bonner, Breazeale and Rushing (1965) - VP0, VI

Zn C₁₄H₆S₂O₈ (zinc anthraquinone 2,7 disulfonic acid)

Bonner et al. (1968) - VP0

Zn C₁₄H₁₂S₂O₆ (zinc bibenzyl disulfonate)

Bonner, Breazeale and Rushing (1965) - VP0, VI

CdCl₂

Dieterici (1923) - VP

Filippov et al. (1971) - VP

Filippov, Yakimov and Tam (1973) - VP

Getman (1928a) - E

Getman (1929) - FP

Getman (1931) - E

Harned and Fitzgerald (1936) - E

Harris (1965) - E

Hass and Jellinek (1932) - ET

Herrera et al. (1944) - E

Horsch (1919) - E

Huang and Pan (1966) - FP

Ishikawa and Takai (1937) - VP

Jones (1893a) - FP

Jones and Chambers (1900) - FP

Jones et al. (1907) - FP

Jones and Getman (1903) - FP

Kertesz (1938) - ET

Leifer et al. (1962) - E

Lucasse (1929) - E

Pan and Ni (1968) - VI

Quintin (1935) - E

Quintin (1936) - E

Reilly and Stokes (1970) - E

Reilly and Stokes (1971) - D

Robinson (1940b) - VI

Shul'ts et al. (1971) - VI

Treumann and Ferris (1958) - E

Cd(C₁₀)₂

Jena and Prasad (1954) - ET

Lilich et al. (1975) - VI

Pan and Ni (1968) - VI

Reilly and Stokes (1971) - D

CdBr₂

Bates (1939) - E

Filippov et al. (1971) - V

Getman (1928a) - E

Getman (1929) - FP

Hass and Jellinek (1932) - ET

Ishikawa and Takai (1937) - VP

Jones (1893a) - FP

Jones et al. (1907) - FP

Jones and Chambers (1900) - FP

Jones and Getman (1903) - FP

Lucasse (1929) - E

Robinson (1940b) - VI

Shul'ts et al. (1971) - VI

CdI₂

Bates (1941) - E

Bates and Vosburgh (1937) - E

Bates and Vosburgh (1938) - E

Chambers and Frazer (1900) - FP

Filippov et al. (1971) - VP

Getman (1928b) - E

Getman (1929) - FP

Hass and Jellinek (1932) - ET

Ishikawa and Takai (1937) - VP
Johnson et al. (1954) - U
Jones (1893a) - FP
Jones et al. (1907) - FP
Jones and Getman (1903) - FP
Klein and Svanberg (1920) - FP
Robinson and Wilson (1940) - VI
Shul'ts et al. (1971) - VI

Cd(CCl₃COO)₂

Kertesz (1938) - ET

Cd(C₆H₃OHC00HSO₃)₂

Kertesz (1938) - ET

Cd(C₆H₄NH₂SO₃)₂

Kertesz (1938) - ET

CdSO₄

Breck (1956) - ET
Dieterici (1923) - VP
Filippov, Makarevskii and Yakimov
(1973) - VP
Getman (1928a) - E
Hausrath (1902) - FP
Herrera et al. (1944) - E
Jones et al. (1907) - FP
Jones and Caldwell (1901) - FP
Jones and Getman (1903) - FP
Kahlenberg (1901) - BP
La Mer and Parks (1931) - E
La Mer and Parks (1933) - E
Lang and King (1954) - ET
Plake (1935) - BP
Robinson and Jones (1936) - VI
Wolten and King (1949) - ET

Cd (C₇H₇O₃S)₂ (cadmium p-toluene sulfonate)

Bonner, Breazeale and Rushing (1965) - VPO

HgCl₂

Kahlenberg (1901) - BP

Biltz (1902) - FP

Hg₂SO₄

Hass and Jellinek (1932) - ET

Sircar et al. (1961) - ET

Hg(CN)₂

Jones and Caldwell (1901) - FP

Cd(NO₂)₂

Chekhunova et al. (1969) - VP

Cd(NO₃)₂

Dieterici (1923) - VP
Ewing and Guyer (1938) - VP
Jones (1893a) - FP
Jones et al. (1907) - FP
Kovyrzina et al. (1956) - VP
Motornaya et al. (1969) - VI
Motornaya and Ben'yash (1973) - VI
Robinson, Wilson and Ayling (1942) - VI

CuCl₂

Biltz (1902) - FP

Downes and Pitzer (1976) - VI

Herrera (1946) - ET

Huang and Pan (1966) - FP

Isaachsen (1891) - FP and BP

Jones et al. (1907) - FP

Jones and Getman (1904) - FP

Jones and Pearce (1907) - FP

Robinson and Stokes (1940c) - VI

Cu(ClO₄)₂

Libus and Sadowska (1969) - VI
Lilich and Andreev (1968) - VP

CuBr₂

Biltz (1902) - FP

CuSO₄

Bedford (1909) - FP
Brown and Prue (1955) - FP
Chambers and Frazer (1900) - FP
Downes and Pitzer (1976) - VI
Getman (1930) - E
Hausrath (1902) - FP
Herrera et al. (1944) - E
Hovorka and Rodebush (1925) - FP
Jones et al. (1907) - FP
Jones and Getman (1903) - FP
Jones and Getman (1904) - FP
Kahlenberg (1901) - FP, BP
Klein and Svanberg (1920) - FP
Kopecky and Dymes (1972) - VPO
Lebette (1934) - E
Lewis and Lacey (1914) - E
Nielsen and Brown (1927) - E
Öholm (1919) - E
Plake (1935) - BP
Quintin (1933a) - E
Quintin (1933b) - E
Quintin (1934) - E
Quintin and Lebette (1934) - E
Rivett (1912) - FP
Robinson and Jones (1936) - VI
Wetmore and Gordon (1937) - E

Cu(NO₃)₂

Jones et al. (1907) - FP
Jones and Getman (1904) - FP
Jones and Pearce (1907) - FP
Robinson, Wilson and Ayling (1942) - VI
Yakimov and Guzhavina (1971) - VP

[Cu(C₂H₈N₂)₂] SO₄

Isono (1970) - FP

Cu(C₇H₇O₃S)₂ (copper p-toluene sulfonate)

Bonner, Breazeale and Rushing (1965) - VPO

Cu C₆H₄S₂O₆ (copper m-benzene disulfonate)

Brubaker and Rasmussen (1963) - VI
Bonner, Rushing and Torres (1968) - VPO

Cu C₁₄H₆S₂O₈ (copper anthraquinone
2,7 disulfonic acid)

Bonner, Rushing and Torres (1968) - VPO

Cu C₁₄H₁₂S₂O₆ (copper
bibenzyl disulfonate)

Bonner, Breazeale and Rushing (1965) - VPO, VI

Cu₃ (C₂₁H₁₇S₃O₉)₂ (copper
1,2,3-triphenylpropane-trisulfonate)

Bonner, Breazeale and Rushing (1965) - VP0, VI

NiCl₂

Biltz (1902) - FP

Dieterici (1923) - VP

Hass and Jellinek (1932) - ET

Jones et al. (1907) - FP

Pearce and Eckstrom (1937a) - V

Plake (1935) - VP

Robinson and Stokes (1940c) - VI

Shul'ts et al. (1962) - VI

Stokes (1948) - VI

Ni(ClO₄)₂

Libus and Sadowska (1969) - VI

Libus and Sadowska (1970) - VI

Lilich and Andreev (1968) - VP

NiSO₄

Brown and Prue (1955) - FP

Dieterici (1923) - VP

Hass and Jellinek (1932) - ET

Hausrath (1902) - FP

Isono (1971) - FP

Jones et al. (1907) - FP

Kahlenberg (1901) - FP, BP

King et al. (1932) - FP

Ojkova (1974) - VI

Plake (1935) - BP

Robinson and Jones (1936) - VI

Ni(NO₃)₂

Dieterici (1923) - VP

Jones et al. (1907) - FP

Jones and Pearce (1907) - FP

King et al. (1932) - FP

Ryubov et al. (1972) - VI

Yakimov and Guzhavina (1971) - VP

[Ni(NH₃)₆](NO₃)₂

King et al. (1932) - FP

[Ni(NH₃)₅]SO₄

King et al. (1932) - FP

Ni C₆H₄S₂O₆ (nickel - m-benzene disulfonate)

Bonner, Rushing and Torres (1968) - VP0

Ni C₁₄H₆ S₂O₈ (nickel anthraquinone
2,7 disulfonic acid)

Bonner, Rushing and Torres (1968) - VP0

Ni C₁₄H₁₂S₂O₆ (nickel
bibenzyl disulfonate)

Bonner, Breazeale and Rushing (1965) - VP0, VI

[Ni(C₆H₅N)](NO₃)₂

King et al. (1932) - FP

CoCl₂

Biltz (1902) - FP
Downes (1975) - VI
Hall and Harkins (1916) - FP
Hass and Jellinek (1932) - ET
Jones et al. (1907) - FP
Jones and Getman (1904) - FP
Jones and Pearce (1907) - FP
Robinson (1938) - VI
Robinson and Brown (1948) - VI
Robinson and Stokes (1940c) - VI

Co(ClO₄)₂

Libus and Sadowska (1969) - VI
Libus and Sadowska (1970) - VI
Lilich and Andreev (1968) - VP

CoBr₂

Isaachsen (1891) - FP, BP
Robinson, McCoach and Lim (1950) - VI

CoI₂

Robinson, McCoach and Lim (1950) - VI

CoSO₄

Brown and Prue (1955) - FP
Jones et al. (1907) - FP
Jones and Getman (1904) - FP
Kahlenberg (1901) - FP, BP
Oikova et al. (1976) - VI

Co(NO₃)₂

Frolov et al. (1974) - VI
Jones et al. (1907) - FP
Jones and Getman (1904) - FP
Jones and Pearce (1907) - FP
Robinson and Brown (1948) - VI
Robinson, Wilson and Ayling (1942) - VI

[Co(NH₃)₃](NO₂)₃

Harkins et al. (1916) - FP

[Co(NH₃)₅NO₂]Cl₂

Harkins, Hall and Roberts (1916) - FP
Masterton and Scola (1964) - VPO

[Co(NH₃)₅F]Cl₂

Masterton and Scola (1964) - VPO

[Co(NH₃)₅Cl]Cl₂

Harkins, Hall and Roberts (1916) - FP

[Co(NH₃)₅Cl](ClO₄)₂

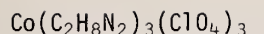
Masterton and Scola (1964) - VPO

[Co(NH₃)₆]Cl₃

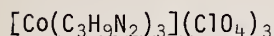
Harkins, Hall and Roberts (1916) - FP
Mori and Tsuchiya (1958) - ET

Co(C₂H₈N₂)₃Cl₃

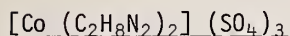
Kard and Dye (1962) - ET



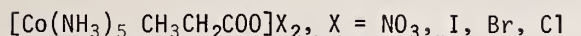
Brubaker and Hass (1961) - VI



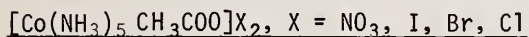
Wynveen et al. (1960) - VI



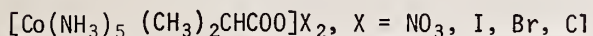
Wynveen et al. (1960) - VI



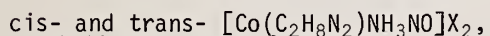
Berka and Masterton (1966) - VPO



Berka and Masterton (1966) - VPO



Berka and Masterton (1966) - VPO



$\text{X} = \text{NO}_3, \text{I}, \text{Br}, \text{Cl}$

Masterton et al. (1967) - VPO



Biltz (1902) - FP

Kangro and Groeneveld (1962) - VP

Stokes and Robinson (1941) - VI



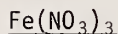
Jones et al. (1907) - FP

Kangro and Groeneveld (1962) - VP

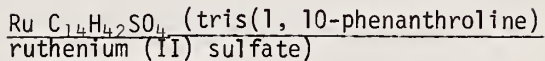
Villaseca and Herrera (1944) - ET



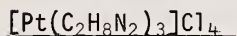
Kahlenberg (1901) - FP, BP



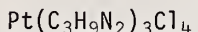
Jones et al. (1907) - FP



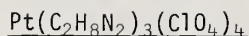
Yokoyama and Yamatera (1975) - VPO



Brubaker (1956) - VI



Groves et al. (1960) - VI



Brubaker (1957) - VI



Biltz (1902) - FP

Downes (1973) - VI

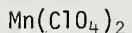
Hass and Jellinek (1932) - ET

Jones et al. (1907) - FP

Perreau (1935b) - VP

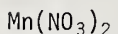
Robinson and Stokes (1940c) - VI

Stokes (1948) - VI



Libus and Sadowska (1969) - VI

Lilich and Andreev (1968) - VP



Ewing, Glick and Rasmussen (1942) - VP

Jones et al. (1907) - FP



Jones et al. (1907) - FP

Kahlenberg (1901) - FP, BP

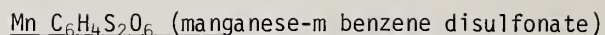
Plake (1935) - BP

Robinson and Jones (1936) - VI

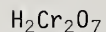
Yokoyama and Yamatera (1975) - VP0



Christoffersen and Prue (1970) - FP



Brubaker and Rasmussen (1963) - VI



Jones et al. (1907) - FP

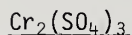


Jones et al. (1907) - FP

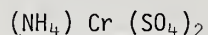


Smith (1947) - VI

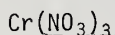
Villaseca and Herrera (1944) - ET



Smith (1947) - VI

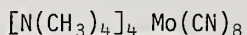


Smith (1947) - VI



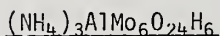
Jones et al. (1907) - FP

Smith (1947) - VI

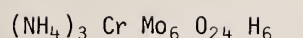


Groves et al. (1960) - VI

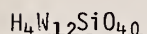
Miller and Porter (1967) - VI



Meyer and Huckfeldt (1970) - VP0



Meyer and Hackfeldt (1970) - VP0



Tyree et al. (1966) - VI



Mason (1938) - VI



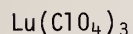
Mason (1938) - VI

Petheram and Spedding (1963) - VI

Spedding, Weber, et al. (1976) - VI



Spedding, Weber, et al. (1976) - VI



Rard, Weber and Spedding (1977) - VI



Dye and Spedding (1953) - ET

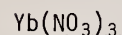
Spedding, Porter and Wright (1952) - ET

Spedding, Weber, et al. (1976) - VI

Spedding and Wright (1951) - ET



Rard, Weber and Spedding (1977) - VI



Heiser (1957) - VI

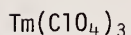
Rard, Shiers, et al. (1977) - VI



Dye and Spedding (1953) - ET

Spedding, Weber, et al. (1976) - VI

Spedding and Dye (1954) - ET



Rard, Weber and Spedding (1977) - VI



Rard, Shiers, et al. (1977) - VI

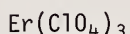


Dye and Spedding (1953) - ET

Petheram and Spedding (1963) - ET

Spedding, Porter and Wright (1952) - ET

Spedding, Weber, et al. (1976) - VI

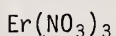


Rard, Weber and Spedding (1977) - VI



Spedding and Yaffe (1952) - ET

Yaffe and Spedding (1952) - ET



Heiser (1957) - VI

Rard, Shiers, et al. (1977) - VI



Dye and Spedding (1953) - ET

Spedding, Weber, et al. (1976) - VI

Spedding and Dye (1954) - ET

Ho(ClO₄)₃

Rard, Weber and Spedding (1977) - VI

HoBr₃

Spedding and Yaffe (1952) - ET

Ho(NO₃)₃

Heiser (1957) - VI

DyCl₃

Dye and Spedding (1953) - ET

Saegar (1960) - VI

Spedding, Weber, et al. (1976) - VI

Spedding and Dye (1954) - ET

Dy(ClO₄)₃

Rard, Weber and Spedding (1977) - VI

TbCl₃

Nelson (1960) - ET

Spedding, Nelson and Rard (1974) - ET

Spedding, Weber, et al. (1976) - VI

Tb(ClO₄)₃

Rard, Weber and Spedding (1977) - VI

TbBr₃

Nelson (1960) - ET

Spedding, Nelson and Rard (1974) - ET

Tb(NO₃)₃

Rard, Shiers, et al. (1977) - VI

GdCl₃

Saeger (1960) - VI

Spedding, Weber, et al. (1976) - VI

Spedding and Yaffe (1952) - ET

Yaffe and Spedding (1952) - ET

Gd(ClO₄)₃

Rard, Weber and Spedding (1977) - VI

GdBr₃

Spedding and Yaffe (1952) - ET

Yaffe and Spedding (1952) - ET

Gd(NO₃)₃

Rard, Shiers, et al. (1977) - VI

EuCl₃

Mason (1941) - VI

Spedding, Weber, et al. (1976) - VI

Spedding, Porter and Wright (1952) - ET

Spedding and Wright (1951) - ET

SmCl₃

Mason (1941) - VI

Saeger (1960) - VI

Spedding et al. (1952) - ET

Spedding, Weber, et al. (1976) - VI

Spedding and Wright (1951) - ET

Sm(ClO₄)₃

Rard, Weber and Spedding (1977) - VI

Sm(NO₃)₃

Heiser (1957) - VI

Rard, Shiers, et al. (1977) - VI

NdCl₃

Bodlander (1915) - FP
Dye and Spedding (1953) - ET
Mason (1938) - VI
Saegar (1960) - VI
Spedding, Weber, et al. (1976) - VI
Spedding and Porter (1951) - ET
Spedding, Porter and Wright (1952) - ET

Nd(ClO₄)₃

Rard, Weber and Spedding (1977) - VI

NdBr₃

Spedding and Yaffe (1952) - ET
Yaffe and Spedding (1952) - ET

Nd₂(SO₄)₃

Bodlander (1915) - FP

Nd(NO₃)₃

O'Brien (1974) - VP

PrCl₃

Mason (1938) - VI
Spedding, Porter and Wright (1952) - ET
Spedding, Weber, et al. (1976) - VI
Spedding and Porter (1951) - ET

Pr(ClO₄)₃

Rard, Weber and Spedding (1977) - VI

PrBr₃

Spedding and Yaffe (1952) - ET
Yaffe and Spedding (1952) - ET

Pr(NO₃)₃

Jones and Getman (1903) - FP

CeCl₃

Mason (1938) - VI
Spedding, Porter and Wright (1952) - ET
Spedding and Porter (1951) - ET

Ce(NO₃)₃

Yakimov and Guzhavina (1971) - VP

LaCl₃

Bodlander (1915) - FP
Gibbard and Wilson (1976) - ET
Harned (1959) - D
Harned and Blake (1951b) - D
Kirgintsev and Luk'yanov (1965) - VI
Mason and Ernst (1936) - VI; Shedlovsky (1950) - ET
Robinson (1937) - VI
Robinson (1939) - VI
Saegar (1960) - VI
Scatchard, Vonnegut and Beaumont (1960) - FP
Shedlovsky (1950)
Shedlovsky and MacInnes (1939) - ET
Spedding, Porter and Wright (1952) - ET
Spedding, Weber, et al. (1976) - VI
Spedding and Porter (1951) - ET
Spedding and Wright (1951) - ET

La(ClO₄)₃

Rard, Weber and Spedding (1977) - VI

LaBr₃

Spedding and Yaffe (1952) - ET
Yaffe and Spedding (1952) - ET

La₂(SO₄)₃

Hovorka and Rodebush (1925) - FP
Noyes and Johnston (1909) - FP

La(NO₃)₃

Hall and Harkins (1916) - FP
Kingintsev and Luk'yanov (1965) - VI
Noyes and Johnston (1909) - FP
O'Brien (1974) - VP
Rard, Shiers, et al. (1977) - VI
Yakimov and Guzhavina (1971) - VP

UO₂F₂

Johnson et al. (1954) - U
Johnson and Kraus (1952) - VI

UO₂Cl₂

Dittrich (1899) - FP
Robinson and Lim (1951) - VI

UO₂(ClO₄)₂

Robinson and Lim (1951) - VI
Rush and Johnson (1971) - VI
Schwabe et al. (1968) - SE

UO₂SO₄

Dittrich (1899) - FP
Patterson et al. (1960) - VI
Robinson (1952) - VI
Soldano and Meek (1963) - VI
Soldano and Patterson (1962) - VI

UO₂(NO₃)₂

Dittrich (1899) - BP
Glueckauf, McKay and Mathieson (1949) - SE
Mikhailov and Torgov (1964) - SE
Robinson and Lim (1951) - VI
Robinson, Wilson and Ayling (1942) - VI

UO₂C₄H₄O₆

Dittrich (1899) - FP

UO₂(C₂H₃O₂)₂

Dittrich (1899) - FP

ThCl₄

Robinson (1955) - VI

Th(NO₃)₄

Apelblat et al. (1973a) - FP
Apelblat et al. (1973b) - VPO
Fricke and Havestadt (1927) - VP
Kirgintsev and Luk'yanov (1965) - VI
Robinson and Levien (1936) - VI

BeSO₄

Fricke and Havestadt (1927) - VP
Robinson (1952) - VI

BeC₂O₄

Sidgwick and Lewis (1926) - FP

MgCl₂

Acheson (1963) - VP
Fricke and Havestadt (1927) - VP
Frolov et al. (1971) - VI
Gibbard and Gosman (1974) - FP
Gregor et al. (1963) - ET
Harned (1959) - D
Harned and Polestra (1954) - D
Jones and Chambers (1900) - FP
Jones and Getman (1903) - FP
Jones and Pearce (1907) - FP
Kahlenberg (1901) - BP
Kirgintsev and Luk'yanov (1966) - VI
Longhi et al. (1973) - E
Loomis (1896a) - FP
Loomis (1896b) - FP
Masaki (1932) - E
Menzel (1927c) - FP
Petit (1965) - VP
Platford (1968b) - VI
Platford (1971) - VI
Rivett (1912) - FP
Robinson and Bower (1966) - VI
Robinson and Stokes (1940a) - VI
Saad et al. (1975) - VI
Serowy and Soika (1965) - U
Stokes (1945c) - VI
Wexler and Hasegawa - VP
Wu, Rush and Scatchard (1968) - VI
Wu, Rush and Scatchard (1969) - VI

Mg(ClO₄)₂

Galkin et al. (1973) - VP
Nicholson and Felsing (1950) - FP
Stokes and Levien (1946a) - VI

MgBr₂

Hass and Jellinek (1932) - ET
Jones et al. (1907) - FP
Jones and Chambers (1900) - FP
Jones and Getman (1903) - FP
Robinson and Stokes (1940a) - VI
Stokes (1948) - VI

MgI₂

Robinson and Stokes (1940a) - VI
Stokes (1948) - VI

MgSO₄

Bedford (1909) - FP
Brown and Prue (1955) - FP
Childs and Platford (1971) - VI
Hall and Harkins (1916) - FP
Hausrath (1902) - FP
Hass and Jellinek (1932) - ET
Hovorka and Rodebush (1925) - FP
Isono (1971) - FP
Jones (1893a) - FP
Kahlenberg (1901) - FP, BP
Kangro and Groeneveld (1962) - VP
Kopecky and Dymes (1972) - VP
Loomis (1893) - FP
Loomis (1894a) - FP
Loomis (1894b) - FP
Oikova et al. (1976) - VI
Patterson et al. (1960)
Plake (1935) - BP
Platford (1967) - VI
Robinson and Jones (1936) - VI
Soldano and Bien (1966) - VI
Soldano and Meek (1963) - VI
Soldano and Patterson (1962) - VI
Yokoyama and Yamatera (1975) - VP
Wu, Rush and Scatchard (1968) - VI
Wu, Rush and Scatchard (1969) - VI

MgS₂O₆

Christoffersen and Prue (1970) - FP

Mg(NO₂)₂

Chekhunova and Protsenko (1967) - VP

Mg(NO₃)₂

Acheson (1963) - VP

Biggs, Parton and Robinson (1955) - VI

Ewing, Klinger and Brander (1934) - VP

Jones et al. (1907) - FP

Jones and Pearce (1907) - FP

Platford (1971) - VI

Rivett (1912) - FP

Robinson, Wilson and Ayling (1942) - VI

Wexler and Hasegawa (1954) - VP

Yakimov and Guzhavina (1971) - VP

Mg(C₂H₃O₂)₂

Stokes (1953) - VI

MgCl₂CHCO₂

Prue et al. (1974) - FP

MgCl₃CCO₂

Prue et al. (1974) - FP

MgCH₃SO₄

Prue et al. (1974) - FP

MgC₁₄H₆S₂O₈

(magnesium anthraquinone 2,7 disulfonic acid)

Bonner, Rushing and Torres (1968) - VP0

Ca(OH)₂

Fosbinder (1929) - ET

CaCl₂

Acheson (1963) - VP

Bechtold and Newton (1940) - VP

Biltz (1902) - VP

Briggs and Lilley (1974) - E

Cachaza and Casal (1973)

Childs and Platford (1971) - VI

Dieterici (1893) - VP

Dieterici (1897) - VP

Drucker and Luft (1926) - ET

Fosbinder (1929) - ET

Gibbard and Fong (1975) - FP

Harned (1959) - D

Harned and Parker (1955) - D

Hepburn (1932a) - VP

Hepburn (1932b) - VP

Huston and Butler (1969) - ET

Jakli, et al. (1975) - VP

Jakli and VanHook (1972) - VP

Jones et al. (1907) - FP

Jones and Getman (1902) - FP

Jones and Chambers (1900) - FP

Jones and Getman (1903) - FP

Jones and Getman (1904) - FP

Jones and Pearce (1907) - FP

Kirgintsev and Luk'yanov (1965) - VI

Kirginstev and Luk'yanov (1966) - VI

Klein and Svanberg (1920) - FP

Loomis (1897a) - FP

Loomis (1897b) - FP

Lucusse (1925) - E, ET

Masaki (1932) - ET

McLeod and Gordon (1945) - ET

Mussini and Pagella (1971) - E

Plake (1935) - BP

Platford (1971) - VI
Platford (1973) - VI
Ponsot (1897) - FP
Rard and Spedding (1977) - VI
Robinson (1940a) - VI
Shedlovsky (1950) - ET
Shedlovsky and MacInnes (1937) - ET
Stokes (1945b) - VI
Stokes (1947) - VP
Tamele (1924) - E

Ca(ClO₄)₂

Galkin et al. (1973) - VP
Lilich and Shelygin (1966) - VP
Nicholson and Felsing (1950) - FP
Robinson, Lim and Ang (1953) - VI

CaBr₂

Hass and Jellinck (1932) - ET
Jones et al. (1907) - FP
Jones and Chambers (1900) - FP
Jones and Getman (1903) - FP
Meyer (1902) - FP
Robinson (1942) - VI
Robinson and McCoach (1947) - VI

CaI₂

Dieterici (1893) - VP
Hass and Jellinck (1932) - ET
Jones et al. (1907) - FP
Meyer (1902) - FP
Robinson (1942) - VI

Ca(NO₂)₂

Chekhunova et al. (1969) - VP

Ca(NO₃)₂

Braunstein and Braunstein (1971) - VI
Jones et al. (1907) - FP
Jones and Pearce (1907) - FP
Kirgintsev and Luk'yanov (1965) - VI
Noyes and Johnston (1909) - FP
Pearce (1936) - VP
Pearce and Blackman (1935) - VP
Plake (1935) - BP
Platford (1971) - VI
Robinson (1940c) - VI
Stokes and Robinson (1948) - VI

CaSO₄

Brown and Prue (1955) - FP
Fosbinder (1929) - ET
Lilley and Briggs (1976) - E
Yokoyama and Yamatera (1975) - VP0

CaS₂O₃

Bichowsky (1923) - FP

CaS₂O₆

Christoffersen and Prue (1970) - FP

CaCH₃SO₄

Prue et al. (1974) - FP

Ca(CH₃COO)₂

Fosbinder (1929) - ET
Plake (1935) - BP

CaCl₂CHCO₂

Prue et al. (1974) - FP

CaCl₃CCO₂

Prue et al. (1974) - FP

Ca(C₃H₅O₃)₂ (calcium lactate)

Fosbinder (1929) - ET.

Ca C₁₄H₁₂S₂O₆ (calcium bibenzyl disulfonate)

Bonner, Breazeale and Rushing (1965) - VP0, VI

Ca(C₇H₇O₃S)₂ (calcium p-toluene sulfonate)

Bonner, Breazeale and Rushing (1965) - VP0

Ca₂Fe(CN)₆

Berkeley, Hartley and Burton (1909) - VP0

Berkeley, Hartley and Burton (1919) - VP0

Noyes and Johnston (1909) - FP

SrCl₂

Acheson (1963) - VP

Biltz (1902) - FP

Downes (1974) - VI

Gregor et al. (1963) - ET

Harned (1959) - D

Hepburn (1932a) - V

Hepburn (1932b) - V

Jones et al. (1907) - FP

Jones and Chambers (1900) - FP

Jones and Getman (1902) - FP

Jones and Getman (1903) - FP

Jones and Getman (1904) - FP

Jones and Pearce (1907) - FP

Klein and Svanberg (1920) - FP

Longhi et al. (1975) - E

Loomis (1897a) - FP

Loomis (1897b) - FP

Lucasse (1925) - E, ET

Masaki (1932) - ET

Phillips et al. (1942) - VI

Robinson (1940a) - VI

Stokes (1948) - VI

Sr(ClO₄)₂

Galkin et al. (1973) - VP

Nicholson and Felsing (1950) - FP

Robinson, Lim and Ang (1953) - VI

SrBr₂

Jones et al. (1907) - FP

Jones and Chambers (1900) - FP

Meyer (1902) - FP

Robinson (1942) - VI

SrI₂

Chambers and Frazer (1900) - FP

Jones et al. (1907) - FP

Meyer (1902) - FP

Robinson (1942) - VI

Sr(NO₂)₂

Chekhunova et al. (1969) - VP

Sr(NO₃)₂

Acheson (1963) - VP

Jones et al. (1907) - FP

Jones and Pearce (1907) - FP

Klein and Svanberg (1920) - FP

Robinson, Wilson and Ayling (1942) - VI

Ba(OH)₂

Harned and Mason (1932) - E

BaCl₂

Acheson (1963) - VP
Ardizzone et al. (1976) - E
Bechtold and Newton (1940) - VP
Bedford (1909) - FP
Berestnewa and Kargin (1935) - ET
Biltz (1902) - VP
Drucker (1913) - ET
Gibbard and Fong (1975) - FP
Hall and Harkins (1916) - FP
Harned (1959) - D
Harned and Polestra (1954) - D
Hass and Jellinek (1932) - ET
Hellams et al. (1965) - VI
Hepburn (1932a) - VP
Hepburn (1932b) - VP
Jablczynski and Legat (1935) - FP
Jones and Dole (1929) - ET
Jones (1893a) - FP
Jones et al. (1907) - FP
Jones and Chambers (1900) - FP
Jones and Getman (1902) - FP
Jones and Getman (1903) - FP
Jones and Getman (1904) - FP
Jones and Pearce (1907) - FP
Kahlenberg (1901) - BP
Klein and Svanberg (1920) - FP
Loomis (1896a) - FP
Loomis (1896b) - FP
Lucasse (1925) - E, ET
Masaki (1932) - ET
Moore et al. (1972) - VI
Newton and Tippetts (1936) - VP
Pan (1966) - VI
Patterson et al. (1960) - VI
Pearce and Gelbach (1925) - E, ET
Perreau (1935b) - VP
Phillips et al. (1942) - VI
Ponsot (1897) - FP

Robinson (1937) - VI
Robinson (1940a) - VI
Robinson (1945) - VI
Robinson and Bower (1965) - VI
Rush and Johnson (1964) - U
Soldano and Bien (1966) - VI
Soldano and Meek (1963) - VI
Soldano and Patterson (1962) - VI
Tippetts and Newton (1934) - E

Ba(ClO₄)₂

Galkin et al. (1973) - VP
Nicholson and Felsing (1950) - FP
Robinson, Lim and Ang (1953) - VI

BaBr₂

Drucker (1913) - ET
Gelbach and Huppke (1926) - E, ET
Jones et al. (1907) - FP
Jones and Chambers (1900) - FP
Jones and Getman (1902) - FP
Klein and Svanberg (1920) - FP
Meyer (1902) - FP
Rivett (1912) - FP
Robinson (1941) - VI

BaI₂

Jones et al. (1907) - FP
Meyer (1902) - FP
Robinson (1942) - VI

BaS₂O₆

Christoffersen and Prue (1970) - FP

Ba(N₃)₂

Torkar and Stern (1972) - E

Ba(NO₂)₂

Chekhunova et al. (1969) - VP

Ba(NO₃)₂

Hausrath (1902) - FP

Hovorka and Rodebush (1925) - FP

Jones and Pearce (1907) - FP

Randall and Scott (1927) - FP

Ratner (1937) - VP

Rivett (1912) - FP

Robinson, Wilson and Ayling (1942) - VI

BaC₂H₃O₂

Stokes (1953) - VI

Li₂SO₄

Äkerlof (1926) - E

Appleby et al. (1934) - VP

Harned (1959) - D

Harned and Blake (1951a) - D

Harned and Äkerlof (1936) - E

Indelli (1953) - FP

Kangro and Groeneveld (1962) - VP

Pearce and Eckstrom (1937b) - VP

Robinson, Wilson and Stokes (1941) - VI

Sircar et al. (1961) - ET

Li₂Si₅O₁₁

Kahlenberg and Lincoln (1898) - FP

Li₂SiO₃

Kahlenberg and Lincoln (1898) - FP

Li₂B₄O₇

Menzel (1927b) - FP

Li₂C₆H₄S₂O₆ (lithium m-benzene disulfonate)

Bonner and Rogers (1961) - VP0

Li₂C₁₄H₁₂S₂O₆ (lithium bibenzyl
4,4'-disulfonate)

Bonner and Rogers (1961) - VP0

Li₂C₂₀H₂₄S₂O₆ (lithium 1,8-diphenylate
disulfonate)

Bonner and Rogers (1961) - VP0

Li₃C₂₁H₁₇S₂O₉ (lithium
1,2,3-triphenyl propane trisulfonate)

Bonner and Overton (1963) - VI

Li₃C₂₃H₂₁S₃O₉ (lithium 1,3,5-triphenyl
pentane trisulfonate)

Bonner and Overton (1963) - VI

Na₂S

Jellinek and Czerwinski (1922) - FP

Khvorostin, Raskina and Filippov (1975) - VI

Na₂SO₃

Lantzke et al. (1973) - VI

Morgan (1961) - VI

Na₂SO₄

Äkerlof (1926) - E
Archibald (1903) - FP
Burge (1963) - VPO
Childs and Platford (1971) - VI
Cudd and Felsing (1942) - VI
de Coppet (1904) - FP
Downes and Pitzer (1976) - VI
Foote et al. (1932) - VP
Gibson and Adams (1933) - VP
Harkins and Roberts (1916) - FP
Harned and Äkerlof (1936) - E
Harned and Blake (1951a) - D
Harned (1959) - D
Harned and Hecker (1934) - E
Hass and Jellinek (1932) - ET
Hellams et al. (1965) - VI
Humphries et al. (1968) - VI
Indelli (1953) - FP
Jakli et al. (1975) - VP
Jones et al. (1907) - FP
Jones and Getman (1904) - FP
Kangro and Groeneveld (1962) - VP
Klein and Svanberg (1920) - FP
Kopecky and Dymes (1972) - VPO
Leopold and Johnston (1927) - VP
Loomis (1896a) - FP
Loomis (1897b) - FP
Moore et al. (1972) - VI
Patterson et al. (1960) - VI
Pearce and Eckstrom (1937b) - V
Perreau (1935a) - VP
Plake (1935) - BP
Platford (1968a) - VI
Platford (1973) - VI
Randall and Scott (1927) - FP
Shibata et al. (1930) - E
Shibata and Murata (1931a) - E
Shibata and Murata (1931b) - E
Sircar et al. (1961) - ET
Soldano and Bien (1966) - VI
Soldano and Meek (1963) - VI

Soldano and Patterson (1962) - VI
Wu, Rush and Scatchard (1968) - VI
Wu, Rush and Scatchard (1969) - VI

Na₂S₂O₃

Perreau (1935b) - VP
Plake (1935) - BP
Richards and Faber (1899) - FP
Robinson, Wilson and Stokes (1941) - VI

Na₂S₂O₆

Lantzke et al. (1973) - VI

Na₂HPO₄

Jones et al. (1909) - FP
Loomis (1897a) - FP
Loomis (1897b) - FP
Nylen and Stelling (1928) - FP
Platford (1974) - VI
Scatchard and Breckenridge (1954) - VI

Na₃PO₄

Loomis (1897a) - FP
Loomis (1897b) - FP

Na₄P₂O₇

Husain (1928) - FP
Miller and Porter (1967) - VI

Na₂HASO₄

Scatchard and Breckenridge (1954) - VI

Na₂CO₃

Biltz (1902) - FP
Ender (1937) - FP
Jones (1893b) - FP
Jones et al. (1907) - FP
Jones and Getman (1904) - FP
Khvorostin, Filippov and Reshetova (1975) - VI
Loomis (1896a) - FP
Loomis (1896b) - FP
Perreau (1935a) - VP
Saegusa (1950) - E
Taylor (1955) - E, VP

Na₂C₆H₄S₂O₆ (sodium - m-benzene disulfonate)

Bonner and Rogers (1961) - VP0

Na₃C₂₁H₁₇S₃O₉ (sodium

1,2,3-triphenyl propanetrissulfonate)

Bonner and Overton (1963) - VI
Bonner, Breazeale and Rushing (1965) - VP0, VI

Na₃C₂₃H₂₁S₃O₉ (sodium

1,3,5-triphenylpentanetrissulfonate)

Bonner and Overton (1963) - VI

Na₂C₁₄H₁₂S₂O₆ (sodium bibenzyl

4,4'-disulfonate

Bonner and Rogers (1961) - VP0

Na₂C₂H₄S₂O₆ (1,2 ethane disulfonate)

Bonner, Rushing, and Torres (1968) - VP0

Na₂C₁₄H₁₀S₂O₈ (sodium anthraquinone

2,7 disulfonate

Bonner, Rushing, and Torres (1968) - VP0

Na₂SiO₃

Bennett (1927) - VP
Cann and Cheek (1925) - BP
Harman (1927) - VP
Kahlenberg and Lincoln (1898) - FP
Loomis (1897a) - FP
Loomis (1897b) - FP

Na₂SiO₅

Kahlenberg and Lincoln (1898) - FP

Na₂Si₅O₁₁

Kahlenberg and Lincoln (1898) - FP

Na₂GeO₃

Pugh (1932) - FP

Na₂B₄O₇

Menzel (1927b) - FP

Na₂B₁₂H₁₂

Wen and Chen (1975) - VI

Na₂CrO₄

Carr and Harris (1949) - VP

Jones et al. (1907) - FP

Stokes (1948) - VI

Na₄Fe(CN)₆

Silvester and Rock (1973) - E

Na₂Cr₂O₇

Carr and Harris (1949) - VP

Jones et al. (1907) - FP

Wexler and Hasegawa (1954) - VP

Na₂MO O₄

Zhidikova et al. (1973) - VI

Na₆[H₂W₁₂O₄₀]

Stock and Plewinsky (1972) - FP, II

K₂SO₄

Abegg (1896) - FP

Äkerlof (1926) - E

Archibald (1903) - FP

Filippov, Makarevskii and Yakimov (1973) - VP

Foot et al. (1932) - VP

Frolov and Nasonova (1974) - VI

Hall and Harkins (1916) - FP

Harkins and Roberts (1916) - FP

Harned and Äkerlof (1936) - FP

Hovorka and Rodebush (1925) - FP

Indelli (1953) - FP

Jones (1893a) - FP

Jones et al. (1907) - FP

Jones and Getman (1904) - FP

Leopold and Johnston (1927) - VP

Loomis (1896a) - FP

Loomis (1896b) - FP

Murata (1932) - E

Osaka (1902) - FP

Pearce and Eckstrom (1937b) - VP

Ponsot (1897) - FP

Plake (1935) - BP

Rivett (1912) - FP

Robinson, Wilson and Stokes (1941) - VI

Shibata et al. (1930) - E

Shibata and Murata (1931a) - E

Shibata and Murata (1931b) - E

Sircar, Jena and Prasad (1961) - ET

Wexler and Hasegawa (1954) - VI

K₂HPO₄

Burge (1963) - VPO

Scatchard and Breckenridge (1954) - VI

K₄P₂O₇

Miller and Porter (1967) - VI

K₂HASO₄

Scatchard and Breckenridge (1954) - VI

K₂CO₃

Biltz (1902) - FP

de Coppet (1904) - FP

Ender (1937) - FP

Jones (1893b) - FP

Jones et al. (1907) - FP

Jones and Getman (1904) - FP

Loomis (1896a) - FP

Loomis (1896b) - FP

K₂C₂O₄

Klein and Svanberg (1920) - FP

Noyes and Johnston (1909) - FP

Plake (1935) - BP

K₂SiO₃

Kahlenberg and Lincoln (1898) - FP

K₂B₄O₇

Menzel (1927b) - FP

Platford (1969) - VI

K₃CO(CN)₆

Robertson and La Mer (1931) - FP

Wynveen et al. (1960) - VI

K₃Fe(CN)₆

Bedford (1909) - FP

Jones et al. (1907) - FP

Robertson and La Mer (1931) - FP

Robinson and Levien (1946) - VI

K₄Fe(CN)₆

Harned (1959) - D

Harned and Hudson (1951) - D

Jones et al. (1907) - FP

Miller and Porter (1967) - VI

Noyes and Johnston (1909) - FP

Robinson (1937) - VI

K₄Mo(CN)₈

Brubaker (1956) - VI

Miller and Porter (1967) - VI

K₂Pt(CN)₄

Groves et al. (1960) - VI

K₄W(CN)₈

Groves et al. (1960) - VI

Miller and Porter (1967) - VI

K₆[H₂W₁₂O₄₀]

Stock and Plewinsky (1972) - FP, U

K₂CrO₄

Stokes, Wilson and Robinson (1941) - VI

K₂Cr₂O₇

Bedford (1909) - FP

Leopold and Johnston (1927) - VP

Stokes, Wilson and Robinson (1941) - VI

Rb₂SiO₄

Cudd and Felsing (1942) - VI

Frolov and Nasonova (1974) - VI

Rb₂SiO₃

Kahlenberg and Lincoln (1898) - FP

Cs₂SiO₄

Cudd and Felsing (1942) - VI

Frolov and Nasonova (1974) - VI

Harned (1959) - D

Harned and Blake (1951c) - D

Cs₂SiO₃

Kahlenberg and Lincoln (1898) - FP

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