

cortex, or of the appearance of the leaf-scars, neither of which is perceptible. It is probably *S. lepidodendrifolia*, with scattered fruits.

In conclusion, it appears to me extremely probable that the following forms, which are usually found associated, are specifically identical:

*S. lepidodendrifolia*, Brongniart.

*S. rhomboidea* and *obliqua*, Brongt.

*S. sculpta*, Lesq.

*S. Brardii*, Brongt.

*S. Menardi*, Brongt.

*S. Serlii*, Brongt.

*S. Defrancii*, Brongt.

With these, future investigation will perhaps unite,

*S. stellata*, Lesq.

*S. spinulosa*, Germ.

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### XIII. Index to the Literature of Vanadium, 1801-1877.

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Read April 2, 1877.

I offer this "Index to the Literature of Vanadium" to chemists, with the hope that it may be of use to them in their researches respecting an element which is beginning to be of value in the arts, and has been the subject of much study during the past year. Dr. H. C. Bolton first suggested the idea of compiling indices to the literature of each of the elements, and has published two, on Uranium and on Manganese, in the Annals of this Society; while a third, on Titanium, has been prepared by Mr. E. J. Hallock.

G. J. R.

[For List of Abbreviations, see page 143.]

1801	Del Rio	Discovery of Erythronium in a lead-ore (Zimapan, Mexico)	Gilb., Ann., LXXI. 7. Gehlen's J., II, 695.
1806	Collet-Descotils	Declares erythronium to be impure Cr. (analysis of the Zimapan lead-ore)	Ann. d. Chimie, LIII, 260.
1830	Sefstrom	Discovery of Vanadium in bar-iron, and refinery slag of Taberg, Sweden	Vetenak. Acad. Handl., 1830 A. o. p., (2) XLVI, 105. Pogg., XXI, 43.
			Phil. Mag., (2) X, 161. Schweigg., LXII, 317 and 2.
1830	Berzelius	Letter announcing Sefstrom's discovery	Am. J. Sci., (1) XX, 386. A. o. p., (2) XLV, 332. Schweigg., LXII, 323.
			" LXII, 28.
1831	Berzelius	Researches (metal, at wt. oxides, compounds with P and S, vanadates)	Abh Schw. Acad. Wiss., 1831. Pogg., XXII, 1. Phil. Mag., (2) X, 321; XI, 7. Berz., Jahresb., XI, 97. Berz., Traité d. Chimie, IV, 642.
1831	Johnston	Vanadinite (Scotland)	Edinb. J. Sci., 1831.
1831	Wohler	Occurrence of Vanadium in the Zimapan lead-ore	Schweigg., LXIII, 119. Pogg., XXI, 49.
1831	Prideaux	Ammonium vanadate and other compounds	Phil. Mag., (2) X, 209.
1831	Berzelius	Analysis of vanadinite (Zimapan, Mexico)	Berz., Jahresb., XI, 200.
1832	Johnson	Vanadinite (Scotland)	Edinb. J. Sci., V, 166, 318. Berz., Jahresb., XII, 97, 171. Am. J. Sci., (1) XXVI, 386.
1832	Berzelius	Vanadium ink	Schweigg., LXIV, 68.
1833	Rose	Vanadinite (Beresowsk, Ural Mts.)	J. o. T., 1860, 291, 817. Pogg., XXIX, 458. A. O. P., XIV, 90.
			Berz., Jahresb., XIV, 196. Leonh., Jahrb., 1834, 231.
1836	Regnault	Action of vapor of water upon the metal	A. o. p., (2) LXII, 357. Ann. d. M., (3) XI, 24.
1837	Damour	Lead vanadate containing Zn and Cu	Ann. d. M., (3) XI, 161. J. pr. Ch., XI, 134.
			Berz., Jahresb., XVIII, 236.
1837	Thomson	Analysis of vanadinite (Wicklow, Ireland)	Thoms., Outlines, I, 574. Leonh., Jahrb., 1837, 332.
1838	Volborth and Hess	Volborthite	Petersb. Acad. Bull., IV, 22. J. pr. Ch., XIV, 52. A. O. P., XXVIII, 341.
			Berz., Jahresb., XIX, 298. Leonh., Jahrb., 1838, 423.
1839	Schrotter	Occurrence of Vanadium in scoria from iron-works	Am. J. Sci., (1) XLII, 367. Pogg., XLVI, 318. Berz., Jahresb., XX, 245.

1839	Svanberg	In hydrophite (analysis)	Vetensk. Acad. Handl., 1839. Pogg., LI, 538.
1840	Kersten	In cupiferous slate (Kupferschiefer)	Pogg., LI, 539. Leonh., Jahrb., 1842, 606. Berz., Jahresb., XXI, 114.
1841	Kersten	"Kupferschiefer" (analysis)	J. pr. Ch., XXII, 381.
1841	Kersten	Occurrence of Vanadium	J. pr. Ch., XXIV, 379.
1842	Wohler	In uraninite (Bohemia)	A. C. P., XLI, 345.
1842	Bodemann	In siderite (Hartz Mts.)	Pogg., LV, 633.
1842	Ficinus	In uraninite	J. pr. Ch., XXVI, 35.
1842	Schultz	In iron-ore (Silesia)	Pharm. Centr., 1842, 372. Berz., Jahresb., XXIII, 120.
1843	Kersten	In iron-ore	Pogg., LIX, 121. Berz., Jahresb., XXIV, 115.
1843	Ficinus	In serpentine (Zobletz)	J. pr. Ch., XXIX, 491. Leonh., Jahrb., 1844, 360. Berz., Jahresb., XXIV, 115.
1844	Schafhaütl	Analysis of vanadin bronze (Bracco)	A. C. P., LI, 254. Berz., Jahresb., XXV, 362. Leonh., Jahrb., 1844, 721.
1846	.....	Copper vanadate (Ural Mts.)	L'Institut, No. 525, 68. Berz., Jahresb., XXV, 333. Am. J. Sci., (2) II, 414.
1847	Plauer	Volborthite (occurrence)	Arch. Wiss. Kunde Rus., VIII, 135. Gorny's Journ., 1847? Rammelsb., Min., 313.
1847	Thomson	Test for vanadic acid in minerals	Phil. Mag., (3) XXXI, 258. J. pr. Ch., XLII, 434. Jahresb., 1847, 965.
1848	Deek	Occurrence in refinery slag, (Staffordshire)	Chem. Gaz., 1848, 298. Pharm. Centr., 1848, 792. Jahresb., 1848, 413.
1848	Domeiko	Analysis of vanadinite and chileite (vanadinkupferbleierz)	Ann. d. M., (4) XIV, 145. Phil. Mag., (3) XXXIV, 395.
1848	Domeiko	Chileite (analysis)	Rammelsb., Min., 314. Compt. rend., XXIV, 793. J. pr. Ch., XLIII, 312.
1849	Credner	Kalkvolborthit (contains analyses)	Pogg., LXXXIV, 546. J. pr. Ch., XLVI, 409. Rammelsb., Min., 314.
1849	Fritzsche	Konichalcite	Pogg., LXXXVII, 140.
1850	Bergemann	Dechenite (determ. of vanadic acid, &c.)	Pogg., LXXX, 393. Arch. ph. nat., XV, 248. Phil. Mag., (4) I, 242. Jahresb., 1850, 752.
1850	Von Kobell	Arsoxene (bleizinkvanadat)	J. pr. Ch., L, 498. Jahresb., 1850, 753.
1850	Fritzsche	Occurrence and preparation of pure vanadic acid	Petersbg. Acad. Bull., IX, 195. A. C. P., LXXVIII, 338. Pharm. Centr., 1851, 375. J. pr. Ch., LIII, 90. Chem. Gaz., IX, 432. Jahresb., 1851, 350.
		Extraction from uraninite	Arch. Pharm., Feb., 1851. J. pr. Ch., LV, 445.
1851		Price of "Bohnerz," containing V <sub>2</sub> O <sub>5</sub>	J. pr. Ch., LII, 320.

1851	Teschemacher	Vanadic ochre (Lake Superior)	Am. J. Sci., (2) XI, 233. Pharm. Centr., 1852, 73. Jahresb., 1851, 764. Leonh. Jahrb., 1856, 193.
1851	Wöhler	Extraction from pisolitic iron ore (Bohnerz)	A. C. P., LXXVIII, 125. Jahresb., 1851, 349.
1852	Müller	Occurrence in "Bohnerz" (Württemberg)	J. pr. Ch., LVII, 124. Z. C. P., 1852, 22.
1853	Müller	Analysis of "Bohnerz" containing V <sub>2</sub> O	A. C. P., LXXXVI, 127. J. pr. Ch., LX, 63.
1853	Mohr?	Chileite	Mohs' Min., 28.
1854	Fischer Nessler	and Eusynchite	Ber. Ges. Freiburg, 1854, III, 33. Leonh. Jahrb., 1855, 570. Jahresb., 1855, 964.
1854	Damour	Descloizite (analysis, &c.)	A. c. p., (3) XLI, 72. J. pr. Ch., LXII, 246. Am. J. Sci., (2) XVII, 434. Pharm. Centr., 1854, 539. Arch. ph. nat., XXV, 78. Leonh. Jahrb., 1854, 346. Jahresb., 1854, 855. Rammelsb., Min., 312.
1854	Descloizeaux	Cryst. form of Descloizite	A. c. p., (3) XLI, 78.
1855	Genth	Volborthite	Am. J. Sci., (2) XIX, 23. Leonh. Jahrb., 1857, 439.
1855	Smith	Descloizite from Penn. (analysis:—occurrence of V <sub>2</sub> O <sub>5</sub> in red varieties of wulfenite)	Am. J. Sci., (2) XX, 246. J. pr. Ch., LXVI, 433. Pharm. centr., 1855, 850. Rammelsb., Min., 313. Jahresb., 1855, 964.
1855	Canaval	Vanadinite from Windischkappel, Carinthia, (cryst. form, sp. gr., &c.)	Jahrb. d. nat. Land., III, 171. Jahresb., 1855, 963.
1855	Bodeker	Vanadium and titanium in clay-ironstone	Leonh. Jahrb., 1857, 173. A. C. P., XCVI, 355.
1856	Patara	Occurrence and separation of vanadium in uraninite (Joachimsthal)	J. pr. Ch., LXVI, 190. Berg Hutenn. Ztg., 1856, No. 31. J. pr. Ch., LXIX, 118.
1856	Von Hauer	Researches (sep. from Joachimsthaler uraninite; estim. of V <sub>2</sub> O <sub>5</sub> ; sep. from Pb, Ba, Sr; reactions of vanadates)	Dingl. pol. J., CXLI, 375. Chem. Centr., 1856, 843. Wien. Acad. Ber., XX, 37. J. pr. Ch., LXIX, 118.
1856	Kennigott	Vanadinite	Dingl. pol. J., CXLI, 375. Jahresb., 1856, 377, 744.
1856	Rammelsberg	Windischkappel vanadinite (cryst. form, analysis, &c.)	Pogg., XCIX, 95. Berl. Acad. Ber., 1856, 153. Pogg., XCVIII, 249. J. pr. Ch., LXVIII, 244. Chem. Centr., 1856, 374. Leonh. Jahrb., 1857, 716. Jahresb., 1856, 872.
1856	Von Hauer	Researches (NH <sub>4</sub> , Na, Ba, Sr vanadates)	Wien. Acad. Ber., XXI, 333. J. pr. Ch., LXIX, 385.
1857	Schabus	Cryst. form of vanadinite	Pogg., C., 297.
1857	Bergemann	Analysis of grönexene	Leonh. Jahrb., 1857, 397. Jahresb., 1857, 683.

1857 Struve	Vanadinite (Beresowsk)	Vehr. d. min. Ges. Petersburg., 1857, III, 42. Jahresb., 1859, 804.
1857 Brush	Dechenite, eusynchite, (presence of ZnO; identity of eusynchite and aræoxene with dechenite, &c.)	Am. Jour. Sci., (2) XXIV, 116. Jahresb., 1857, 685.
1857 Wohler	Detection of vanadic acid in wulfenite	A. C. P., CII, 383. J. pr. Ch., LXXI, 447. Jahresb., 1857, 199.
1858 Uhrlaub	Compounds of vanadium with nitrogen	Pogg., CIII, 134. J. pr. Ch., LXXIII, 378. Chem. Centr., III, 166.
1858 Grailich	Cryst. form of vanadates	Kryst. Untersuch., 3.
1858 Schafarik	Researches (chlorides, metal, vanadic acids, &c.)	Wien Acad. Ber., XXXIII, 3. A. C. P., CIX, 84. J. pr. Ch., LXXVI, 142. Chem. Centr., 1859, 97.
1858 Hallwachs and Schafarik	Action of ethyl iodide on vanadium	A. C. P., (3) LV, 497. Jahresb., 1858, 166. Wien Acad. Ber., XXXIII, 569. A. C. P., CIX, 206. Chem. Centr., 1859, 161. J. pr. Ch., LXXVI, 140. N. Jahrb. Pharm., XI, 201. Rep. chim. pure, J, 334. Jahresb., 1859, 407.
1859 Von Hauer	Strontium trivanadate	J. pr. Ch., LXXVI, 156. Jahresb., 1859, 177.
1859 Handl	Cryst. form of the above	Wien Acad. Ber., XXXVII, 391. Jahresb., 1859, 178.
1859 Buff	Electrolytic	A. C. P., CX, 257. Chem. Centr., 1859, 686. Phil. Mag., (4) XVII, 394. Jahresb., 1859, 34.
1859 Beauvallet	Occurrence in clay (Genève)	Compt. rend., XLIX, 301. Ann. d. M., (5) XVII, 20. Rep. chim. appl., I, 406. J. pr. Ch., LXXXIV, 256. Phil. Mag., (6) XVIII, 480.
1859 Von Hauer	Vanadates (NH <sub>4</sub> , Na, Sr, Ba, Ca, Mg vanadates)	Wien Acad. Ber., XXXIX, 299, 448. J. pr. Ch., LXXX, 324. Chem. Centr., 1860, 439. Rep. chim. pure, II, 208. Chem. News, 1860, 59. Jahresb., 1860, 164.
1859 Hermann	Vanadium gummite	J. pr. Ch., LXXXVI, 328.
1860 Engelbach	V and Ti in brachydolerite and nepheline dolerite (Vogelsberg)	Jahresb., 1860, 810.
1860 Nordenskiöld	Vanadic acid (cryst. form, properties)	Oefv. Ak. Stockh., 1860. Pogg., CXII, 160. Jahresb., 1860, 164.

1860	Terrell	Occurrence in clays (Gentilly, Forges les-Eaux, and Dreux)	Comp. rend., LI, 94. Rep. chim. pur., II, 283. Chem. Centr., 1860, 896.
1861	Zippé	Rhombic vanadite	Wien Acad. Ber., XLIV, (I Abth.) 197. Leonh., Jahrb., 1862, 728. Jahresb., 1861, 1020.
1861	Tschermak	Analysis of rhombic vanadite	Wien Acad. Ber., XLIV, (II Abth.) 157. Leonh., Jahrb., 1862, 728. Jahresb., 1861, 1021.
1861	Werther	Delicate test for vanadic acid	J. pr. Ch., LXXXIII, 195. N. Arch. ph. nat., XI, 82. Z. anal. C., I, 72. Rep. chim. pure, IV, 57. Jahresb., 1861, 849.
1861	St. Claire Deville	Extraction from iron-ore (Baux)	Ann. d. M., (5) XVII, 19. Compt. rend., XLIX, 210. J. pr. Ch., LXXXIV, 255. Dingl. pol. J., CLXIII, 396. Pol. Notizbl., 1862, 64. J. c. T., 1862, 334.
1861	St. Claire Deville	Analysis of aluminous minerals containing $V_2O_5$ , (detection in cryolite, &c.)	A. c. p., (3) LXI, 309, 342. Chem. News; 1862, 103.
1862	Böttger	Extraction from "Bohnerz"	Jahres. des phys. Ver. zu Frankfurt, 1861-2, 70. J. pr. Ch., XC, 33. Dingl. pol. J., CLXVIII, 392. Bull. soc. chim., VI, 183. Chem. Centr., 1864, 416. Pol. Centr., 1863, 1100. Jahresb., 1863, 219.
1862	Schrauf	Zippé's vanadite compared with dechenite and descloizite	Pogg., CXVI, 355. Leonh., Jahrb., 1862, 1000. Jahresb., 1862, 754.
1862	Tschermak	Criticism on Schrauf.	Pogg., CXVII, 349. Jahresb., 1862, 754.
1862	Thompson	Argyllite or lead-sulphovanadate	London J. of Arts, N. S., XVI, 260.
1863	Schafarik	Researches (at. wt., oxides, compound with P and S, vanadium residues, &c.)	Wien Acad. Ber., XLVII, (II Abth.) 246. J. pr. Ch., XC, 1. Chem. Centr., 1863, 634. Z. C., 1863, 408. Bull. soc. chim., VI, 23. Jahresb., 1863, 15, 219.
1863	Phipson	Vanadic ochre (contains analyses of clays, bog-iron ores, &c., containing vanadic acid)	Compt. rend., LVII, 152. J. Chem. Soc., (2) I, 244. Chem. News, VII, 210. J. pr. Ch., XCI, 49; XCII, 63. Chem. Centr., 1863, 987. J. c. T., 1863, 376. Leonh., Jahrb., 1863, 861. Jahresb., 1863, 219, 861.
1863	Thompson	Action of vanadium on iron	Le Technologiste, 1863, 450. Pol. Centr., 1863, 1172. Dingl. pol. J., CLXIX, 475.

	Action of vanadium on iron	Berg. Hattenm. Ztg., 1863, 380. J. c. T., 1863, 60.
	Researches (oxygen compounds: estim. of $V_2O_5$ , sep. from Zn: review of previous analyses of de-chenite, vanadinite, ar-cexene, eusynohite, &c)	Pogg., OXX, 17. Chem. Centr., 1864, 161. Jahresb., 1863, 221, 826. Leonh., Jahrb., 1864, 237. Z. anal. C., 1864, 377. J. c. T., 1864, 285. Am. J. Sci. (2) XXXVII, 270.
	Occurrence in gray pig-iron; and mode of ex-traction	J. Chem. Soc., (2) II, 21. Chem. News, 1863, 361, 277. Chem. Centr., 1864, 688. Bull. soc. chim. (2) II, 286. Pol. Notizbl., 1864. Jahresb., 1864, 232. Dingl. pol. J., CLXXV, 244. J. c. T., 1864, 58.
1864 Rammelsberg		
		Leonh., Jahrb., 1864, 844. Bull. soc. chim. (2) II, 344. J. Pharm., (3) XLVI, 70. Institut., 1864, 160. Jahresb., 1864, 855.
1864 Huber		
1864 Rammelsberg	Katzenellenbogen) Occurrence in soda-lye	Berl. Acad. Ber., 1864, 680. J. pr. Ch., XCIV, 237. Chem. Centr., 1865, 1801. Z. C., 1865, 581. Pol. Centr., 1865, 1081.
1865 Engelbach		
1865 Baumgarten		
1866 Bunsen	Flame-reactions	Jahresb., 1865, 165, 219. A. C. P., CXXXVIII, 257. Z. anal. C., V, 351. Phil. Mag., (4) XXXII, 81. N. Arch. ph. nat., XXVII, 25. Jahresb., 1866, 782.
1867 Roscoe	Researches, Part L (1) Occurrence in copper-bearing beds at Alder-ley Edge and Mottram, St. Andrews, Cheshire, (2) sep., (3) at. wt., (4) estim., (5) oxides, (6) trides.)	Phil. Trans., 1868, 1. Proc. Roy. Soc., XVI, 220. Phil. Mag., (4) XXXV, 307. A. C. P., Suppl., VI, 77. Am. J. Sci., (2) XLV, 394. Chem. News, XVII, 135. Z. C., 1868, 417. A. c. p., (4) XIV, 438. J. pr. Ch., CIV, 429. Jahresb., 1867, 2 Dt. Ind. Ztg., 1

1868	Rammelsberg	Ammonium tungsto-vanadate $[(NH_4)_2O, 3V_2O_5, WO_3 + 8H_2O]$	D. O. Ges., 1868, 158. Z. O., 1868, 226. Chem. Centr., 1868, 652. Jahresb., 1868, 226.
1868	Thalén	Spectrum, giving wave-lengths	Nova Acta Reg. Upsal., 1868, (3) VI. A. o. p., (4) XVIII, 243. Roscoe's Spect. Anal., 1873, 123.
1869	Roscoe	Researches. Part II. (1) metal, (2) chloride.	Phil. Trans., 1869, 679. Proc. Roy. Soc., XVIII, 37. Phil. Mag., (4) XXXIX, 148. Chem. News, XX, 37. Am. J. Sci., (2) XLVIII, 407. A. C. P. Suppl., VII, 1869, 70. J. pr. Ch., CVIII, 303. D. O. Ges., 1869, 424. Z. O., 1869, 653. Bull. soc. chim., XII, 447. Jahresb., 1869, 289.
186	mith	Desloizite (Penn.)	Am. J. Sci., (2) XLVIII, 137. Jahresb., 1869, 1231.
1869	Desloizeaux	Ionimetric measurement of the above	Am. J. Sci., (2) XLVIII, 137.
1870	Roscoe	Researches. Part III. (1) metal, (2) V and I., (3) V. and Br., (4) vanadates, absorption of oxygen by vanadic acid, bleaching properties of same, &c.)	Phil. Trans., 1870, 317. Proc. Roy. Soc., XVIII, 316. Phil. Mag., (4) XL, 62. Am. J. Sci., (3) I, 374. Chem. News, XXI, 183. A. C. P. Suppl., 1870, VIII, 95. Z. C., 1870, 357. Chem. Centr., 1870, 644. D. O. Ges., 1870, 432. Bull. soc. chim., XIV, 208. Am. Chem., 1871, 435. Jahresb., 1870, 368, 1314.
1870	Hermann	Vanadinite (association, analysis, &c.)	Bull. Soc. Imp. Moscow, XLII, 234. J. pr. Ch., (2) I, 442. Chem. Centr., 1870, 424. Am. J. Sci., (2) L, 273. Leonh., Jahrb., 1870, 780. Jahresb., 1870, 1287.
1870	Schrauf	Vanadinite, dechenite, desloizite, &c., (cryst. forms and relations of chromo-wulfenites, vanadinite, dechenite, &c.)	Wiën. Acad. Ber., (1 Abth.) LXIII, 167. Proc. Roy. Soc., XIX, 451. Chem. News, XXIII, 230, 246. J. Chem. Soc., (2) IX, 500. Leonh., Jahrb., 1871, 163, 638. Jahresb., 1871, 1168.
1871	Roscoe	Estimation of vanadic acid	J. Chem. Soc., (2) IX, 28. Z. anal. C., X, 223. Bull. soc. chim., XVII, 43. Jahresb., 1871, 942.
1871	Roscoe	Orthovanadates	Z. anal. C., X, 224. Bull. soc. chim., XVII, 42.
1871	Lightfoot	Estimation of vanadium on aniline salts	Pamphlet, Manchester, 1871, 36 pp. Bull. Soc. Ind. d. Mulhouse, XLI, 285.

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| 1871 | Lightfoot            | Action of vanadium on aniline salts  | Textile Colorist, 1876, 130.  |
| 1871 | Thorpe               | Vanadyl-chlorides  | Phil. Mag., (4) XLII, 305.  |
| 1871 | Frenzel              | Pucherite, a new mineral, (cryst. form, analyses, &c.)   | J. pr. ch., (2) IV, 227, 353.<br>Leonh., Jahrb., 1872, 97, 514, 939<br>Jahresb., 1871, 1168.  |
| 1871 | Pinkney              | Application of vanadium and uranium together, or in combination with nickel, for producing aniline black (patented Oct. 16)  | Textile Colorist, 1876, 115, 131.<br>Bull. soc. chim., XVIII, 47.   |
| 1871 | Pinkney              | Vanadium marking-ink, "Jetoline," (patented Oct. 16)   | Textile Colorist, 1876, 198.  |
| 1871 | Thorpe               | Vapor density of vanadyl-trichloride   | Chem. News, XXIV, 287.<br>Jahresb., 1871, 57.   |
| 1872 | Maskelyne and Flight | Analysis of vanadinite, (S. Africa)  | J. Chem. Soc., (2) X, 1053.<br>Jahresb., 1872, 1129.  |
| 1872 | Kenngott             | Descloizite isomeric with lead sulphate  | Zürich. naturf. G., (3) XVI, 137.<br>Leonh., Jahrb., 1872, 535.<br>Jahresb., 1872, 1129.  |
| 1872 | Websky               | Cryst. form of pucherite, (Schneeberg)<br>Separation. Application of ammonium vanadate to making ink<br>Ardennite (properties and analysis)<br>Occurrence and detection of vanadium in trap-rock | Leonh., Jahrb., 1873, 183.<br>Jahresb., 1872, 1129.<br>Jahresb. des phys. Ver. zu Frankfurt, 1871-2, 18.<br>Chem. Centr., IV, 514.<br>Bull. soc. chim., XX, 501.<br>Chem. News, XXIX, 62.<br>Leonh., Jahrb., 1872, 930.<br>Chem. News, XXVI, 183.<br>J. Chem. Soc., (2) X, 1116.<br>Bull. soc. chim., XIX, 123.<br>Jahresb., 1872, 916. |
| 1872 | E. Sonstadt          | Occurrence in trap-rock  | Chem. News, XXVI, 214.  |
| 1872 | Lavanix and          | Occurrence in ardennite  | Leonh., Jahrb., 1872, 930;  |
| 1872 | R. J. Hodges         | Occurrence in iron-ore, (Antrim, Ireland)  | Chem. News, XXVI, 238.<br>Jahresb., 1872, 267.  |
| 1872 | Carnelley            | Thallium vanadates. Separation of vanadium   | A. C. P., CLXVI, 155.<br>J. Chem. Soc., (2) XI, 323.<br>Bull. soc. chim., XIX, 500.   |
| 1872 | Pisani               |  |   |
| 1873 | V. Rousset           | Occurrence in basalt, near Clermont-Ferrand. (Detect of small quantities in silicates.)  | Compt. rend., LXXVII, 1102.<br>Bull. soc. chim., XXI, 71.<br>Chem. News, XXVIII, 313.<br>Jahresb., 1873, 944.   |

1873	B. Apjohn	Occurrence in meteorites	J. Chem. Soc. (2) XII, 104. Chem. News, XXVIII, 278. Am. Chemist, V, 29. Jahresb., 1874, 897, 1340.
1873	Norblad	Vanadium salts (sep. of vanadic acid from alkalies and alkaline earths)	Bull. soc. chim., XXIII, 64. D. C. Ges., VIII, 128. Z. anal. C., XIV, 344.
1874	Lasaulx	Presence of vanadium in ardenite	Leonh., Jahrb., 1874, 276.
1874	Jas. Gibbons	Photographic properties	Chem. News, XXX, 287. Les Mondes, 1875, XXXVI. Bull. soc. chim., XXIV, 368. Am. Chemist, VI, 277. Jahresb., 1874, 171.
1874	Sellon and Pinkney	Vanadium salts in conjunction with vegetable and animal coloring matter, for dyeing and printing (Pat. Dec. 4)	Textile Colorist, 1876, 80, 122, 131.
1875	A. A. Hayes	Wide diffusion of V compounds, associated with P in porphyritic and slate rocks, occurrence in natural waters, &c.	Proc. Am. Acad. Sci., X, 300. Chem. News, XXXII, 34. Am. J. Sci., (3) X, 61.
1875	H. C. Bolton	Occurrence in uraninite	Am. Chemist, V, 363.
1875	H. Fresenius	Action of H <sub>2</sub> SO <sub>4</sub> on vanadic acid.	Z. anal. C., XIV, 193.
1875	Frenzel	Descloizite, vanadinite (analyses &c.)	Leonh., Jahrb., 1875, 673.
1875	Jno. Priestley	Physiological effect	Proc. Roy. Soc., XXIV, 40.
1875	P. Bedson	Compound of ether and vanadyltrichloride—(VOCl <sub>3</sub> + C <sub>4</sub> H <sub>10</sub> O)	A. C. P., CLXXX, 935.
1876	R. Pinkney	Vanadium in production of aniline black	Moniteur de la Teinture, III, 208. Bull. soc. chim., XXV, 45.
1876	A. Guyard	Aniline black by means of vanadium salts	Bull. soc. chim., XXV, 58. Textile Colorist, 1876, 131, 284. Am. Chemist, VII, 114.
1876	M. A. Rosenstiehl	Aniline black	Bull. soc. chim., XXV, 291.
1876	A. Guyard	Vanadium salts	Bull. soc. chim., XXV, 350.
1876	Von Zepharovich	Red vanadinite	Leonh., Jahrb., 1876, 561.
1876	B. W. Gerland	Sulphates; metavanadic acid	D. C. Ges., IX, 863. Bull. soc. chim., XXVII, 52.
1876	Rosenstiehl	Aniline black	v. c. p., (2) VIII, 561.
1876	Lasaulx	Occurrence of vanadium in ardenite; analysis &c.	Leonh., Jahrb., 1876, 363.
1876	G. A. Koenig	Occurrence in schorlomite, perowskite, and other minerals from Arkansas	Proc. Phila. Acad. Sci. 1876, 37.
1876	J. Walz	Occurrence in American magnetites	Am. Chemist, VI, 453.

1876		Vanadium in dyeing and calico printing	Textile Colorist, 1876.
1876	F. A. Genth	Roscoelite, a vanadium mica	Am. Chemist, VII, 57. Am. J. Sci., (3) XI, July.
1876	C. M. Stillwell	Occurrence in American hematites and other secondary iron ores	Phil. Mag., (5) 11, 156. Am. Chemist, VII, 41.
1876	Witz, M. G.	Use of vanadium in preparing aniline black	Compt. rend., 1876. Am. Chemist, VII, 61.
1876	Homme	Experiments upon the uses of aniline black in dyeing woolen and mixed tissues	Bull. Soc. Ind. Rouen, IV, 263. Textile Colorist, 1876. Am. Chemist, VII, 60.
1876	M. A. Rosenstiehl	Theory of the formation of aniline black	Bull. Soc. Ind. Mulhouse, 1876.
1876	Crow	Tetroxide	Am. Chemist, VII, 94.

## EXPLANATION OF ABBREVIATIONS.

Abh. Schw. Acad. Wiss.	Abhandlungen der königlichen Schwedischen Academie der Wissenschaften, Stockholm.
A. c. p.	Annales de chimie et de physique, Paris.
A. C. P.	Annalen der Chemie and Pharmacie, Heidelberg.
Am. Chemist	American Chemist, C. F. and W. H. Chandler, New York.
Am. J. Sci.	American Journal of Science and Arts, Silliman and Dana, New Haven, Ct.
Ann. d. Chimie	Annales de Chimie, Paris.
Ann. d. M.	Annales des Mines, Paris.
Arch. Pharm.	Archiv der Pharmacie, Bley, Halle, etc.
Arch. ph. nat.	Archives des sciences physiques et naturelles, Genève.
Arch. wiss. Kunde Russ.	Archiv für wissenschaftliche Kunde von Russland, Berlin.
Ber. Acad. Ber.	Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Preussische Academie der Wissenschaften zu Berlin.
Ber. Ges. Freiburg	Bericht d. Gesellsch. f. Naturwissenschaften zu Freiburg.
Ber. Wiener Weltausstellung	Bericht über die Wiener Weltausstellung von 1873, Braunschweig, 1875.
Berg Hüttenm. Ztg.	Berg-und Hüttenmannische Zeitung, Leipzig.
Berz., Jahresb.	Jahresbericht über die Fortschritte der Chemie, etc., Berzelius, Tübingen.
Berz., Traité d. chimie	Traité de chimie. Berzelius.
Bull. Sci. St. Petersb.	Bulletin Scientifique publié par l'Académie Imp. des Sciences de St. Petersbourg.
Bull. soc. chim.	Bulletin de la Société chimique de Paris.
Bull. soc. Ind. Mulhouse	Bulletin de la Société Industrielle de Mulhouse.
Bull. soc. Ind. Rouen	Bulletin de la Société Industrielle de Rouen.
Bull. soc. Imp. Moscou	Bulletin de la Société Impériale des naturalistes de Moscou.

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| Chem. Centr.             | Chemisches Centralblatt, Knop ; Leipzig.   |
| Chem. Gaz.               | Chemical Gazette, Francis and Croft, London.   |
| Chem. News.              | Chemical News, Crookes, London.  |
| Compt. rend.             | Comptes rendus hebdomadaires des séances de l'Académie des sciences, Paris.              |
| Dingl. pol. J.           | Polytechnisches Journal. Dingler ; Stuttgart.  |
| D. C. Ges.               | Berichte der deutschen chemischen Gesellschaft zu Berlin.                                |
| Dt. Ind. Ztg.            | Deutsche Industrie Zeitung, Binder ; Leipzig.  |
| Edinb. J. Sci.           | Edinburgh Journal of Science, Brewster.  |
| Engineering.             | Engineering, London.   |
| Gehlen's J.              | Allgemeines Journal der Chemie, Gehlen ; Berlin.   |
| Gilb., Ann.              | Annalen der Physik, Gilbert : Halle.   |
| Instit.                  | L'Institut ; section des sciences mathématiques, physiques et naturelles, Arnott, Paris. |
| Jahrb. d. nat. Land.     | Jahrbuch d. naturhist. Landmuseums von Kärnten.  |
| Jahresb.                 | Jahresbericht über die Fortschritte der Chemie, Giessen.                                 |
| Jahres. des phys. Ver. 2 | Jahresbericht des physikalischen Vereins zu Frankfurt am Rhein.                          |
| Frankfurt                |  |
| J. c. T.                 | Jahresbericht über die Fortschritte der chemischen Technologie, Wagner ; Leipzig.        |
| J Chem. Soc.             | Journal of the Chemical Society, London.   |
| J. pr. Ch.               | Journal für praktische Chemie, Erdmann.  |
| J. Pharm.                | Journal de Pharmacie et de Chimie, Paris.  |
| Kryst. Untersuch.        | Krystallographische Untersuchungen, Grmlich ; Wien and Olmütz, 1868.                     |
| Les Mondes.              | Les Mondes, Moigno ; Paris.  |
| Le Technologiste         | Le Technologiste, Paris.   |
| Leonh., Jahrb.           | Jahrbuch für Mineralogie, Geognosie, etc., Leonhard ; Heidelberg.                        |
| London J. of Arts.       | London Journal of Arts and Sciences, Newton ; London.                                    |
| Mohs' Min.               | Grundriss der Mineralogie, Mohs.   |
| Monit. de la teinture    | Moniteur de la teinture, Paris.  |
| N. Arch. ph. nat.        | Nouvelles archives des sciences physiques et naturelles, Genève.                         |
| N. Jahrb. Pharm.         | Neues Jahrbuch für Pharmacie, Speyer.  |
| Nova Acta Reg. Upsal.    | Nova Acta Reg. Soc. Sci. Upsal., Third Series, Upsala, 1868.                             |
| Oefv. Ak. Stockh.        | Oefversigt af Kongl. Vetenskaps-Akademien's Forhandlingar ; Stockholm.                   |
| Petersb. Acad. Bull.     | Bulletin de l'Académie des Sciences de St. Pétersbourg.                                  |
| Pharm. Centr.            | Pharmaceutisches Centralblatt, Leipzig.  |
| Phil. Mag.               | London, Edinburgh, and Dublin Philosophical Magazine, London.                            |
| Phil. Trans.             | Philosophical Transactions of the Royal Society of London.                               |
| Pogg.                    | Annalen der Physik and Chemie, Poggendorff ; Berlin.                                     |
| Pol. Centr.              | Polytechnisches Centralblatt.  |
| Pol. Notizbl.            | Polytechnisches Notizblatt.  |
| Proc. Am. Acad. Sci.     | Proceedings of the American Academy of Sciences, Boston.                                 |
| Proc. Phila Acad. Sci.   | Proceedings of the Philadelphia Academy of Natural Sciences, Philadelphia.               |
| Proc. Roy. Soc.          | Proceedings of the Royal Society of London.  |
| Rammelsbg., Min.         | Handb. der Mineralchemie, Rammelsberg 1860.  |

Reimann's Färberzeitung	Reimann's Färberzeitung.
Rép. chim. appl.	Répertoire de chimie appliquée, Paris.
Rép. chim. pure.	Répertoire de chimie pure et appliquée, Paris
Roscoe's Spect. Anal.	Spectrum Analysis, H. E. Roscoe; Third Edition, 1873, London.
Schweigg.	Journal für Chemie und Physik, Schweigger; Nürnberg.
Textile Colorist.	Textile Colorist, Chas. O'Neill; Manchester.
Thoms., Outlines.	Outlines of Mineralogy, T. Thomson.
Verh. d. min. Ges. St. Petersburg.	Verhandlungen der Russisch-Kaiserlichen Mineralogischen Gesellschaft zu St. Petersburg.
Vetensk. Acad. Handl.	Kongl. Svenska Vetenskaps Academiens Handlingar, Stockholm.
Vierteljahres. Pharm.	Vierteljahresschrift für praktische Pharmacie, Wittstein; München.
Wien. Akad. Ber.	Sitzungsberichte der naturwissenschaftlichen Classe der Kaiserlichen Academie der Wissenschaften zu Wien.
Z. C.	Zeitschrift für Chemie, Göttingen.
Z. C. P.	Zeitschrift für Chemie und Pharmacie, Erlangen.
Z. anal. C.	Zeitschrift für analytische Chemie, Fresenius; Wiesbaden.
Zurich naturf. G.	Vierteljahresschrift der naturforschenden Gesellschaft in Zurich, R. Wolf.