SMITHSONIAN MISCELLANEOUS COLLECTIONS.

156

# CATALOGUE

OF

# MINERALS,

WITH THEIR FORMULAS, ETC.

PREPARED FOR THE SMITHSONIAN INSTITUTION.

BY

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# ADVERTISEMENT.

THE following Catalogue of Mineral Species has been prepared by Mr. Egleston, at the request of the Institution, for the purpose of facilitating the arranging and labelling of collections, and the conducting of exchanges, as well as of presenting in a compact form an outline of the science of mineralogy as it exists at the present day.

In labelling collections it is considered important to give the chemical composition as well as the names, and hence the formulæ have been added.

Some doubt was at first entertained as to the system of classification which ought to be adopted; but after due consideration it was concluded to make use of that followed by Professor Dana, in the last edition of his Manual of Mineralogy. Whatever difference of opinion may exist as to the best classification, the one here employed is that which will be most generally adopted in this country, on account of the almost exclusive use of Professor Dana's excellent Manual.

The Institution is under obligations to Prof. Dana, Prof. Brush, Dr. Genth, and other gentlemen, for their assistance in perfecting the work, and carrying it through the press.

Copies of the Catalogue, printed on one side only, to be cut apart for labels, can be furnished on application.

JOSEPH HENRY,
*Secretary S. I.*

SMITHSONIAN INSTITUTION,
June, 1863.

# INTRODUCTION.

To render the present Catalogue of Minerals more than a mere enumeration of names, the formulæ expressing the chemical composition of the mineral and the system in which it crystallizes, as far as at present understood, have been given. The classification adopted is Dana's, as published in the fourth edition of his Mineralogy. Some species that have proved not to be well founded have been omitted, and many since published have been added. Of these latter species, some must be considered as having only a provisional place in the series, and it is probable that others will ultimately be dropped altogether. In making the additions and corrections, the Supplements to Dana's Mineralogy, which have appeared from time to time in *Silliman's Journal*, have always been consulted, and the most probable formulæ, as deduced by recent investigations, have been selected. In a few instances a change has been made in the place of a species where a more thorough examination has thrown light upon the true nature of the mineral or where it has been found that the system of crystallization had previously been incorrectly given. *Faujasite*, p. 19, was formerly considered as *dimetric*, it has lately been proved to be *monometric*, and it has therefore been placed among the monometric zeolites. The formula for *Euclase* is the one given by Rose; Damour's analysis gave water, and the formula $2\ddot{B}e\,\breve{S}i_4^3 + 3\ddot{A}l\,\breve{S}i_4^3 + \dot{H}$. Rammelsberg has recently discovered the existence of protoxides in *Staurotide*, and proposes as a general formula $(\dot{R}, \dot{R}^2) + \breve{S}i^n$. In the formula for *Opal*, water has not been written,

as it is found in very variable quantities, and is not considered as essential. For what is known of the species added to the list of organic compounds, see the 2d, 5th, 6th, and 7th Supplements to Dana's Mineralogy. For changes in the systems of crystallization, Des-Cloizeaux has generally been the authority.

A table of the symbols used, with illustrations of the meaning of the formulæ, are given on p. vii., and on p. ix. will be found a table relating to the systems of crystallization. In the first column are the simple forms from which all the others, of the same system, are derived; in the second the description of the axes of these simple forms, and in the others the nomenclature that has been adopted by the authors whose names stand at the head of the column. The axes of a crystal are imaginary lines drawn through its centre and about which it is symmetrical. It has been found most convenient to refer to the systems of crystallization by the numbers which have been placed on the left hand of the table.

An asterisk following the name of a mineral, as *Gold*,* p. 1, denotes that it has been found in the United States. A dagger, as *Danburite*,† p. 14, denotes that it has been found in the United States only. The other minerals have not, so far as is known, been found in this country.

T. EGLESTON.

New York, May, 1863.

# CHEMICAL SYMBOLS.

| | | | |
|---|---|---|---|
| Ag. (Argentum) | Silver. | Mg. | Magnesium. |
| Al. | Aluminium. | Mn. | Manganese. |
| Aq. | Water. | Mo. | Molybdenum. |
| As. | Arsenic. | N. | Nitrogen. |
| Au. (Aurum) | Gold. | Na. (Natrum) | Sodium. |
| B. | Boron. | Ni. | Nickel. |
| Ba. | Barium. | O. | Oxygen. |
| Be. (Beryllium) | Glucinum. | Os. | Osmium. |
| Bi. | Bismuth. | P. | Phosphorus. |
| Br. | Bromine. | Pb. (Plumbum) | Lead. |
| C. | Carbon. | Pd. | Palladium. |
| Ca. | Calcium. | Pt. | Platinum. |
| Cb. | Columbium. | Rd. | Rhodium. |
| Cd. | Cadmium. | Ru. | Ruthenium. |
| Ce. | Cerium. | S. | Sulphur. |
| Cl. | Chlorine. | Sb. (Stibium) | Antimony. |
| Co. | Cobalt. | Se. | Selenium. |
| Cr. | Chromium. | Si. | Silicium. |
| Cu. (Cuprum) | Copper. | Sn. (Stannum) | Tin. |
| D. | Didymium. | Sr. | Strontium. |
| F. | Fluorine. | Ta. | Tantalum. |
| Fe. (Ferrum) | Iron. | Tb. | Terbium. |
| H. | Hydrogen. | Te. | Tellurium. |
| Hg. (Hydrargyrum) | Mercury. | Th. | Thorium. |
| I. | Iodine. | U. | Uranium. |
| Ir. | Iridium. | V. | Vanadium. |
| K. (Kalium) | Potassium. | W. (Wolframium) | Tungsten. |
| La. | Lanthanum. | Y. | Yttrium. |
| Li. | Lithium. | Zn. | Zinc. |
| $\overline{\text{M}}$. | Mellic Acid. | Zr. | Zirconium. |

Note.—R is an indefinite symbol, and may refer to any one or more of the symbols in the table. In the formulæ given in the Catalogue the dots over the symbols indicate atoms of oxygen—thus, Fe indicates one atom

of Iron combined with one of Oxygen. A dashed letter indicates a double atom of the substance—thus, $\ddot{\text{F}}\text{e}$ means two atoms of Iron combined with three of Oxygen. A general formula has sometimes been given when one or more of the elements are replaced by others in variable proportions, or for species which include several important varieties, as Melinophane, p. 12, Allanite and others, p. 14, Pyroxene, p. 11, Amphibole and Peridot, p. 12, &c. In these formulæ $\dot{\text{R}}$ represents all the bases composed of one atom of an element and one of Oxygen, and $\ddot{\text{R}}$ all those composed of two atoms of an element and three of Oxygen. Thus the general formula for the family of the Chlorites, p. 17, is $5\dot{\text{R}}^3\,\ddot{\text{S}}\text{i}_4^3 + 3\ddot{\text{R}}\,\ddot{\text{S}}\text{i}_4^3 + 12\dot{\text{H}}$, which means that the mineral contains five atoms of a compound made up of three atoms of proto-base combined with three-quarters of an atom of silicic acid, plus three atoms of a compound of one atom of sesqui-base combined with three-quarters of an atom of silicic acid, plus 12 atoms of water. In Chlorite and Pennine the proto-bases are Magnesia and Iron, but in Clinochlore Magnesia only; in Chlorite and Clinochlore the sesqui-base is Alumina only, while in Pennine it is Alumina and Iron. It will thus be seen that a large figure written as a co-efficient refers to the whole of the member to which it is prefixed, while a small figure written as an exponent refers only to the symbol to which it is attached. Thus $5\dot{\text{R}}^3\,\ddot{\text{S}}\text{i}_4^3$ means five atoms of $\dot{\text{R}}^3\,\ddot{\text{S}}\text{i}_4^3$, while $\dot{\text{R}}^3$ means simply three atoms of $\dot{\text{R}}$. When the symbols are written together the substances are in chemical combination—thus As S which is the formula for Realgar, p. 2, characterizes that mineral as a sulphuret of Arsenic. When one element is combined with several these are placed in brackets and each symbol is followed by a comma—thus Smaltine (Co, Fe, Ni) $\text{As}^2$, p. 4, is an Arseniuret of Cobalt, Iron, and Nickel. In this case the proportions of Cobalt, Iron, and Nickel are not stated. In the formula of Eisennickelkies $(\frac{1}{3}\text{Ni} + \frac{2}{3}\text{Fe})\,\text{S}$, p. 3, a sulphuret of Nickel and Iron, the proportions are stated. The general formula in this case would be RS; one-third of R is Nickel, and the other two-thirds Iron. When more than one element is combined with several others, both members are written in brackets; thus Glaucodot (Co, Fe) $(\text{S, As})^2$, p. 4, is a Bi-sulpho-arseniuret of Cobalt and Iron. In some instances, as Bismuth Silver, p. 1, no formula has been given, but simply an enumeration of the elements of which the mineral is composed; in this case each symbol is followed by a comma.

When the water of a mineral has not been determined, it has been written Aq. instead of $\dot{\text{H}}$.

# SYSTEMS OF CRYSTALLIZATION.

| No. | Simple Forms. | Axes. |
|---|---|---|
| 1 | Cube and octahedron. | 3 axes rectangular and equal. |
| 2 | Right prism with square base. | 3 axes rectangular, 2 equal. |
| 3 | Right prism with rectangular or rhombic base. | 3 axes rectangular and unequal. |
| 4 | Right rhomboidal and oblique rhombic prisms. | 3 axes unequal, 2 rectangular. |
| 5 | Oblique disymetric rhomboidal prism. | 3 axes unequal, and unequally inclined. |
| 6 | Rhombohedron and hexagonal prism. | 4 axes, 3 equal and equally inclined, 1 at right angles to the other three. |

NAMES USED BY DIFFERENT AUTHORS.

| No. | Naumann. | Mohs. | Weiss & Rose. | Phillips. | Delafosse. | Dana. |
|---|---|---|---|---|---|---|
| 1 | Tesseral. | Tessular. | Regular. | Cubic. | Cubic. | Monometric. |
| 2 | Tetragonal. | Pyramidal. | 2 and 1 axial. | Pyramidal. | Tetragonal. | Dimetric. |
| 3 | Rhombic. | Orthotype. | 1 and 1 axial. | Prismatic. | Orthorhombic. | Trimetric. |
| 4 | Monoclinohedric. | Hemiorthotype. | 2 and 1 membered. | Oblique. | Clinorhombic. | Monoclinic. |
| 5 | Triclinohedric. | Anorthotype. | 1 and 1 membered. | Anorthic. | Clinohedric. | Triclinic. |
| 6 | Hexagonal. | Rhombohedral. | 3 and 1 axial. | Rhombohedral. | Hexagonal. | Hexagonal. |

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# CATALOGUE OF MINERALS.

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| | **A. NATIVE ELEMENTS.** | | |
| | 1. *Hydrogen Group.* | | |
| 1. | **Gold *** | Au | 1 |
| 2. | **Platinum *** | Pt | 1 |
| 3. | **Platiniridium *** | Ir, Pt | 1 |
| 4. | **Palladium** | Pa | 1 |
| 5. | **Quicksilver *** | Hg | 1 |
| 6. | **Amalgam** | $Ag\,Hg^2$ and $Ag\,Hg^3$ | 1 |
| 7. | **Arquerite** | $Ag^6\,Hg$ | 1 |
| 8. | **Gold Amalgam *** | $(Au, Ag)^2\,Hg^5$ | |
| 9. | **Silver *** | Ag | 1 |
| 10. | **Bismuth Silver** | Fe, Bi, Pb, Ag | 1? |
| 11. | **Copper *** | Cu | 1 |
| 12. | **Lead** | Pb | 1 |
| 13. | **Iron *** | Fe | 1 |
| 14. | **Tin** | Sn | 2 |
| 15. | **Zinc** | Zn | 6 |
| | 2. *Arsenic Group.* | | |
| 16. | **Iridosmine *** | Ir, Os, Rd | 6 |
| 17. | **Tellurium** | Te | 6 |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 18. | **Bismuth** * | Bi | 6 |
| 19. | **Tetradymite** * | Bi, Te | 6 |
| 20. | **Antimony** | Sb | 6 |
| 21. | **Arsenic** * | As | 6 |
| 22. | **Arsenical Antimony** * | Sb, As | 6 |
| 23. | **Sulphur** * | S | 3 |
| 24. | **Selenium** | Se | 4 |
| 25. | **Selensulphur** | Se, S | |
| | 3. *Carbon Group.* | | |
| 26. | **Diamond.** * | C | 1 |
| 27. | **Mineral Coal** | C | |
| | 27a. Anthracite * | | |
| | 27b. Bituminous Coal * | | |
| | 27c. Jet * | | |
| | 27d. Lignite * | | |
| 28. | **Graphite** * | C | 6 |

## B. SULPHURETS, ARSENIURETS, ETC.

### I. BINARY COMPOUNDS.

#### 1. Compounds of Elements of the Arsenic Group with one another.

| | | | |
|---|---|---|---|
| 29. | **Realgar** | As S | 4 |
| 30. | **Orpiment** * | $As^2 S^3$ | 3 |
| 31. | **Dimorphine** | $As^4 S^3$ | 3 |
| 32. | **Bismuthine** * | $Bi^2 S^3$ | 3 |
| 33. | **Stibnite** * | $Sb^2 S^3$ | 3 |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|

## 2. Compounds of Elements of the Arsenic Group with those of the Hydrogen Group.

### 1. *Discrasite Division.*

| | | |
|---|---|---|
| 34. Discrasite | $Ag^2 Sb$ | 3 |
| 35. Domeykite * | $Cu^3 As^2$ | |
| 36. Algodonite * | $Cu^6 As^1$ | |
| 37. Whitneyite * | $Cu^9 As^2$ | |

### 2. *Galena Division.*

| | | |
|---|---|---|
| 38. Silver Glance * | Ag S | 1 |
| 39. Erubescite * | (Fe, Cu) S | 1 |
| 40. Galena * | Pb S | 1 |
| 41. Steinmannite | Pb, S, Sb | 1 |
| 42. Cuproplumbite ? | 2Pb S + Cu S | 1 |
| 43. Alisonite | 3Cu S + Pb S | |
| 44. Manganblende | Mn S | 1 |
| 45. Syepoorite | Co S | |
| 46. Eisennickelkies | ($\frac{1}{3}$Ni + $\frac{2}{3}$Fe) S | 1 |
| 47. Clausthalite | Pb Se | 1 |
| 48. Naumannite | Ag Se | 1 |
| 49. Berzelianite | Cu Se | |
| 50. Eucairite | (Cu, Ag) Se | |
| 51. Hessite * | Ag Te | 1? |
| 52. Altaite | Pb Te | 1 |
| 53. Grünauite | (Bi, Ni, Co, Fe)$^2$ $S^3$ | 1 |
| 54. Blende * | Zn S | 1 |
| 55. Copper Glance * | Cu S | 3 |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 56. | **Akanthite** | Ag S | 3 |
| 57. | **Stromeyerite** | (Cu, Ag) S | 3 |
| 58. | **Cinnabar** * | Hg S | 6 |
| 59. | **Millerite** * | Ni S | 6 |
| 60. | **Pyrrhotine** * | $Fe^7 S^8$ | 6 |
| 61. | **Greenockite** | Cd S | 6 |
| 62. | **Wurtzite** | Zn S | 6 |
| 63. | **Onofrite** | $Hg^6 Se^5$ | |
| 64. | **Copper Nickel** * | Ni As | 6 |
| 65. | **Breithauptite** * | Ni Sb | 6 |
| 66. | **Kaneite** | Mn As | |
| 67. | **Schreibersite** | Fe, P, Ni | |

### 3. *Pyrites Division.*

| | | | |
|---|---|---|---|
| 68. | **Pyrites** * | $Fe S^2$ | 1 |
| 69. | **Hauerite** | $Mn S^2$ | 1 |
| 70. | **Smaltine** * | $(Co, Fe, Ni) As^2$ | 1 |
| 71. | **Cobaltine** | $Co (S, As)^2$ | 1 |
| 72. | **Gersdorffite** * | $Ni (S, As)^2$ | 1 |
| 73. | **Ullmannite** | $Ni (S, As, Sb)^2$ | 1 |
| 74. | **Marcasite** * | $Fe S^2$ | 3 |
| 75. | **Rammelsbergite** | $Ni As^2$ | 3 |
| 76. | **Leucopyrite** * | $Fe As^2$ | 3 |
| 77. | **Mispickel** * | $Fe (As, S)^2$ | 3 |
| 78. | **Glaucodot** | $(Co, Fe) (S, As)^2$ | 3 |
| 79. | **Sylvanite** * | $(Ag, Au) Te^2$ | 3 |
| 80. | **Nagyagite** | $(Pb, Au) (Te, S)^2$ | 2 |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 81. | **Covelline** | $\dot{C}u\,S^2$ | 6 |
| 82. | **Molybdenite** * | $Mo\,S^2$ | 6 |
| 83. | **Riolite** | $Ag\,Se^2$ | 6? |
| | *4. Skutterudite Division.* | | |
| 84. | **Skutterudite** | $Co\,As^3$ | 1 |

## II. DOUBLE BINARY COMPOUNDS.

### 1. The Persulphuret a Sulphuret of an Element of the Hydrogen Group, as of Iron, Cobalt, or Nickel.

| | | | |
|---|---|---|---|
| 85. | **Linnæite** * | $Co\,S + Co^2\,S^3$ | 1 |
| 86. | **Cuban** | $Cu\,S + Fe^2\,S^3$ | 1 |
| 87. | **Chalcopyrite** * | $\dot{C}u\,S + Fe^2\,S^3$ | 2 |
| 88. | **Barnhardite** * | $2\dot{C}u\,S + Fe^2\,S^3$ | 2 |
| 89. | **Tin Pyrites** | $\dot{C}u\,S\,(Sn^2\,S^3, Fe^2\,S^3)$ | 2? |
| 90. | **Sternbergite** | $Ag\,S + 2Fe^2\,S^3$ ? | 3 |

### 2. The Persulphuret a Sulphuret of Elements of the Arsenic Group.

| | | | |
|---|---|---|---|
| 91. | **Wolfsbergite** | $\dot{C}u\,S + Sb^2\,S^3$ | 3 |
| 92. | **Tannenite** | $\dot{C}u\,S + Bi^2\,S^3$ | 3? |
| 93. | **Berthierite** | $Fe\,S + Sb^2\,S^3$ | |
| 94. | **Zinkenite** | $Pb\,S + Sb^2\,S^3$ | 3 |
| 95. | **Miargyrite** | $Ag\,S + Sb^2\,S^3$ | 4 |
| 96. | **Plagionite** | $Pb\,S + \frac{3}{4}Sb^2\,S^3$ | 4 |
| 97. | **Jamesonite** | $Pb\,S + \frac{2}{3}Sb^2\,S^3$ | 3 |
| 98. | **Heteromorphite** | $Pb\,S + \frac{1}{2}Sb^2\,S^3$ | |
| 99. | **Brongniardite** | $(Pb, Ag)\,S + \frac{1}{2}Sb^2\,S^3$ | 1 |
| 100. | **Chiviatite** | $(\dot{C}u, Pb)\,S + \frac{1}{2}Bi^2\,S^3$ | |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 101. | **Dufrenoysite** | $PbS + \frac{1}{2}As^2S^3$ | 1 |
| 102. | **Pyrargyrite** | $AgS + \frac{1}{3}Sb^2S^3$ | 6 |
| 103. | **Proustite** * | $AgS + \frac{1}{3}As^2S^3$ | 6 |
| 104. | **Freieslebenite** * | $(Ag, Pb)S + \frac{1}{3}Sb^2S^3$ | 4 |
| 105. | **Bournonite** | $(Cu, Pb)S + \frac{1}{3}Sb^2S^3$ | 3 |
| 106. | **Kenngottite** | Ag, Pb, S, Sb | 4 |
| 107. | **Boulangerite** | $PbS + \frac{1}{3}Sb^2S^3$ | |
| 108. | **Aikinite** | $(Cu, Pb)S + \frac{1}{3}Bi^2S^3$ | 3 |
| 109. | **Wölchite** | Pb, Cu, As, Sb, S | 3 |
| 110. | **Clayite?** | (Cu, Pb) (S, As, Sb) | 1 |
| 111. | **Kobellite?** | $(Fe, Pb)S + \frac{2}{3}(Sb, Bi)^2S^3$ | 1? |
| 112. | **Meneghinite** | $PbS + \frac{1}{4}SbS^3$ | |
| 113. | **Tetrahedrite** * | $(Cu, Fe, Zn, Ag)S + \frac{1}{4}(Sb, As)^2S^3$ | 1 |
| 114. | **Tennantite** * | $(Cu, Fe)S + \frac{1}{4}As^2S^3$ | 1 |
| 115. | **Geocronite** * | $PbS + \frac{1}{6}(Sb, As)^2S^3$ | 3 |
| 116. | **Polybasite** | $(Ag, Cu)S + \frac{1}{3}(Sb, As)^2S^3$ | 6 |
| 117. | **Stephanite** | $AgS + \frac{1}{6}Sb^2S^3$ | 3 |
| 118. | **Enargite** * | $(Cu, Fe, Zn)S + \frac{1}{3}(As, Sb)^2S^5$? | 3 |
| 119. | **Xanthocone** | $(3AgS + As^2S^5) + 2(3AgS + As^2S^3)$ | 6 |
| 120. | **Fireblende** | Ag, S, Sb | 4 |
| 121. | **Wittichite** | Cu, Bi, S | 3 |

## C. FLUORIDS, CHLORIDS, BROMIDS, IODIDS.

### 1. *Calomel Division.*

| | | | |
|---|---|---|---|
| 122. | **Calomel** | $Hg^2Cl$ | 2 |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| | *2. Rock Salt Division.* | | |
| 123. | **Sylvine** | K Cl | 1 |
| 124. | **Salt** * | Na Cl | 1 |
| 125. | **Sal Ammoniac** | $NH^4$ Cl | 1 |
| 126. | **Kerargyrite** * | Ag Cl | 1 |
| 127. | **Embolite** | 3Ag Cl + 2Ag Br | 1 |
| 128. | **Bromyrite** | Ag Br | 1 |
| 129. | **Iodo-bromid of Silver** | Ag, I, Br | |
| 130. | **Fluor** * | Ca F | 1 |
| 131. | **Yttrocerite** * | Ca F, YF, Ce F | |
| 132. | **Iodyrite** | Ag I | 6 |
| 133. | **Coccinite** | Hg I | 2? |
| 134. | **Fluocerite** | Ce, Y, HF | 6 |
| 135. | **Fluocerine** | $Ce^2 F^3$ + 3 Ce H | 1? |
| 136. | **Cotunnite** | Pb Cl | 3 |
| 137. | **Muriatic Acid** | H Cl | |
| 138. | **Cryolite** | Na F + $\frac{1}{3}Al^2 F^6$ | 2 |
| 139. | **Chiolite** | Na F + $\frac{2}{3}Al^2 F^3$ | 2 |
| 140. | **Fluellite** | Al, F | 3 |
| 141. | **Carnallite** | K Cl + Mg Cl + 12H | |
| 142. | **Tachhydrite** | Ca Cl + 2Mg Cl + 12H | |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|

## D. OXYGEN COMPOUNDS.

## I. BINARY COMPOUNDS.

### 1. Oxides of the Elements of the Hydrogen Group.

#### A. Anhydrous Oxides.

##### 1. *Monometric.*

| | | | |
|---|---|---|---|
| 143. | **Periclase** | Ṁg | 1 |
| 144. | **Red Copper** * | Ċu | 1 |
| 145. | **Martite** * | F̈e | 1 |
| 146. | **Iserine** | Ḟe (F̈e, T̈i) | 1 |
| 147. | **Irite?** | (İr, Ös, Ḟe) (Ir, Os, Cr)$^2$ O$^3$? | 1 |
| 148. | **Spinel** * | * Ṁg Ä̇l | |
| 149. | **Magnetite** * | Ḟe F̈e | 1 |
| 150. | **Magnoferrite** | † Ṁg$^3$ F̈e$^4$ | 1 |
| 151. | **Franklinite** * | (Ḟe, Żn)$^3$ (F̈e, M̈n) | 1 |
| 152. | **Chromic Iron** * | (Ḟe, Ṁg) (Ä̇l, C̈r) | 1 |
| 153. | **Pitchblende** | U Ü? | 1 |
| 154. | **Melaconite** * | Ċu | 1? |
| 155. | **Plumbic Ochre** * | Ṗb | |

##### 2. *Hexagonal.*

| | | | |
|---|---|---|---|
| 156. | **Water** * | Ḣ | 6 |
| 157. | **Zincite** * | Żn | 6 |
| 158. | **Corundum** * | Ä̇l | 6 |
| 159. | **Hematite** * | F̈e | 6 |
| 160. | **Ilmenite** * | T̈i, F̈e, | 6 |
| 161. | **Plattnerite** | Ṗb | 6? |
| 162. | **Tenorite** | Ċu | 6? |

* Ṁg may be replaced by Ċa, Ḟe, Ṁn, or Żn, alone or in combination.

† Rammelsberg gives the formula Ṁg$^m$ F̈e$^n$, and gives 3 and 4 as the probable values of m and n.

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| | | 3. *Dimetric.* | |
| 163. | **Braunite** * | $\dot{M}n\,\dot{M}n$ | 2 |
| 164. | **Hausmannite** * | $\dot{M}n\,\ddot{M}n$ | 2 |
| 165. | **Cassiterite** * | $\dot{S}n$ | 2 |
| 166. | **Rutile** * | $\dot{T}i$ | 2 |
| 167. | **Anatase** * | $\dot{T}i$ | 2 |
| | | 4. *Trimetric.* | |
| 168. | **Chalcotrichite** * | $\dot{C}u$ | 3 |
| 169. | **Chrysoberyl** * | $\ddot{B}e + \ddot{A}l^3$ | 3 |
| 170. | **Brookite** * | $\dot{T}i$ | 3 |
| 171. | **Pyrolusite** * | $\dot{M}n$ | 3 |
| 172. | **Polianite** | $\dot{M}n\,\ddot{M}n$ | 3 |
| | | *Appendix to Anhydrous Oxides.* | |
| 173. | **Minium** * | $\dot{P}b^2\,\dot{P}b$ | |
| 174. | **Crednerite** | $\dot{C}u^3\,\ddot{M}n^2$ | 4 |
| 175. | **Heteroclin?** | $\ddot{M}n, \ddot{S}i$ | 4 |
| 176. | **Palladinite?** * | $\dot{P}a$ | |
| | | 5. *Combinations of Oxides and Chlorides or Sulphurets.* | |
| 177. | **Voltzite** | $4Zn\,S + \dot{Z}n$ | |
| 178. | **Matlockite** | $Pb\,Cl + \dot{P}b$ | 2 |
| 179. | **Mendipite** | $Pb\,Cl + 2\dot{P}b$ | 3 |
| 180. | **Percylite?** | $(Pb\,Cl + \dot{P}b) + (Cu\,Cl + \dot{C}u) + Aq$ | 1 |
| 181. | **Karelinite?** | $\ddot{B}i + Bi\,S$ | |
| | | B. Hydrous Oxides. | |
| 182. | **Diaspore** * | $\ddot{A}l\,\ddot{H}$ | 3 |
| 183. | **Göthite** * | $\ddot{F}e\,\ddot{H}$ | 3 |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 184. | **Manganite** | $\dot{M}n\,\dot{H}$ | 3 |
| 185. | **Limonite** * | $\dot{F}e^2\,\dot{H}^3$ | |
| 186. | **Brucite** * | $\dot{M}g\,\dot{H}$ | 6 |
| 187. | **Gibbsite** * | $\ddot{A}l\,\dot{H}^3$ | 6 |
| | *Appendix to Hydrous Oxides.* | | |
| 188. | **Völknerite** * | $\dot{M}g^6\,\ddot{A}l + 16\dot{H}$ | 6 |
| 189. | **Hydrotalcite** | $\dot{M}g^3\,\ddot{A}l + 12\dot{H}$ | |
| 190. | **Psilomelane** * | $(\dot{M}n, \dot{B}a)\,\dot{M}n^2 + \dot{H}$ | |
| 191. | **Newkirkite** | $\dot{M}n, \dot{F}e, \dot{H}$ | |
| 192. | **Wad** * | $*\,\dot{R}\,\dot{M}n + \dot{H}$ | |
| 193. | **Atacamite** | $Cu\,Cl + 3\dot{C}u\,\dot{H}$ | 3 |

## 2. Oxides of Elements of the Arsenic Group.

### 1. *Arsenic Division.*

| | | | |
|---|---|---|---|
| 194. | **Arsenolite** * | $\ddot{A}s$ | 1 |
| 195. | **Senarmontite** | $\ddot{S}b$ | 1 |
| 196. | **Valentinite** | $\ddot{S}b$ | 3 |
| 197. | **Bismuth Ochre** * | $\ddot{B}i$ | |
| 198. | **Kermesite** | $2Sb\,S^3 + \ddot{S}b$ | 4 |
| 199. | **Retzbanyite** | $(3Bi\,S + 2Cu\,S, Pb\,S) + 2\dot{P}b\,\ddot{S}$ | |
| 200. | **Cervantite** | $\ddot{S}b + \ddot{S}b$ | |
| 201. | **Volgerite** | $\ddot{S}b + 5\dot{H}$ | |
| 202. | **Ammiolite** | $\dot{H}g, \ddot{S}b, \dot{F}e, \dot{H}$ | |

### 2. *Sulphur Division.*

| | | | |
|---|---|---|---|
| 203. | **Sulphurous Acid** * | $\ddot{S}$ | |
| 204. | **Telluric Ochre** | $\ddot{T}e$? | |

* $\dot{R} = \dot{K}, \dot{B}a, \dot{C}o, \dot{M}n.$

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 205. | **Sulphuric Acid** * | S̈ Ḣ | |
| 206. | **Wolframine** * | Ẅ | 1 |
| 207. | **Molybdine** * | M̈o | 3 |

### 3. Oxygen Compounds of Carbon, Boron and Silicon.

| | | | |
|---|---|---|---|
| 208. | **Carbonic Acid** * | C̈ | |
| 209. | **Sassolin** | B̈ Ḣ³ | 5 |
| 210. | **Quartz** * | S̈i | 6 |
| | 210ᵃ. Jasper * | | |
| | 210ᵇ. Agate * | | |
| | 210ᶜ. Chalcedony * | | |
| 211. | **Opal** * | S̈i | |
| | 211ᵃ. Precious opal | | |
| | 211ᵇ. Semi-opal * | | |
| | 211ᶜ. Hyalite * | | |
| | 211ᵈ. Geyserite | | |

## II. OXYGEN DOUBLE BINARY COMPOUNDS.

### 1. Silicates.

#### A. Anhydrous Silicates.

##### 1. *Edelforsite Section.*

| | | | |
|---|---|---|---|
| 212. | **Edelforsite** | Ċa S̈i | |

##### 2. *Augite Section.*

| | | | |
|---|---|---|---|
| 213. | **Wollastonite** * | Ċa³ S̈i² | 4 |
| 214. | **Pyroxene** | Ṙ³ S̈i² | 4 |
| | 214ᵃ. Diopside * | (Ċa, Ṁg)³ S̈i² | |
| | 214ᵇ. Hedenbergite * | (Ċa, Ḟe)³ S̈i² | |
| | 214ᶜ. Augite * | (Ċa, Ṁg, Ḟe)³ S̈i² | |
| 215. | **Pelicanite** | Ä̇l S̈i³ + 2Ḣ | |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 216. | **Spodumene** * | $(\dot{L}i, \dot{N}a)^3 \ddot{S}i^2 + 4\ddot{A}l\,\ddot{S}i^2$ | 4 |
| 217. | **Prehnitoid** | $(\dot{N}a, \dot{C}a)^3 \ddot{S}i^2 + 2\ddot{A}l\,\ddot{S}i^2$ | |
| 218. | **Amphibole** | $\dot{R}^4 \ddot{S}i^3$ | 4 |
| | 218a. Tremolite * | $(\dot{C}a + 3\dot{M}g)\,\ddot{S}i^3$ | |
| | 218b. Actinolite * | $(\dot{C}a + 3(\dot{M}g, \dot{F}e))\,\ddot{S}i^3$ | |
| | 218c. Hornblende * | $(\dot{F}e + 3\dot{M}g)\,\ddot{S}i^3$ | |
| 219. | **Acmite** | $\dot{N}a\,\ddot{S}i + \dot{F}e\,\ddot{S}i^2$ | 4 |
| 220. | **Strakonitzite?** | $\dot{C}a, \dot{M}g, \dot{F}e, \ddot{A}l, \ddot{S}i, \dot{H}$ | 4 |
| 221. | **Enstatite** | $\dot{M}g^3 \ddot{S}i^2$ | 3 |
| 222. | **Anthophyllite** * | $(\dot{F}e + 3\dot{M}g)\,\ddot{S}i^3$ | 3 |
| 223. | **Hypersthene** * | $(\dot{F}e, \dot{M}n)^3 \ddot{S}i^2$ | 3 |
| 224. | **Wichtyne** | $(\dot{N}a, \dot{C}a, \dot{M}g, \dot{F}e)^3 \ddot{S}i + \ddot{A}l\,\ddot{S}i^2$ | |
| 225. | **Babingtonite** * | $(\dot{C}a, \dot{F}e)^6 \ddot{S}i^5$ | 5 |
| 226. | **Rhodonite** * | $\dot{M}n^3 \ddot{S}i^2$ | 5 |
| 227. | **Beryl** * | $(\frac{1}{2}\ddot{B}e + \frac{1}{2}\ddot{A}l)\,\ddot{S}i^2$ | 6 |
| 228. | **Eudialyte** | $2(\dot{C}a, \dot{N}a, \dot{F}e)^3 \ddot{S}i^2 + \ddot{Z}r\,\ddot{S}i^2$ | 6 |
| | 3. *Eulytine Section.* | | |
| 229. | **Eulytine** | $\ddot{B}i^2 \ddot{S}i^3$ | 1 |
| 230. | **Leucophane** | $\dot{C}a^3 \ddot{S}i^2 + \ddot{B}e\,\ddot{S}i + Na\,F$ | 3 |
| 231. | **Melinophane** | * $\dot{R}^3 \ddot{S}i^2 + \ddot{R}\,\ddot{S}i + Na\,F$ | 6? |
| | 4. *Garnet Section.* | | |
| 232. | **Peridot** | $\dot{R}^3 \ddot{S}i$ | 3 |
| | 232a. Forsterite * | $\dot{M}g^3 \ddot{S}i$ | |
| | 232b. Chrysolite * | $(\dot{M}g, \dot{F}e)^3 \ddot{S}i$ | |
| | 232c. Fayalite * | $\dot{F}e^3 \ddot{S}i$ | |

* $\dot{R} =$ Ca. Na. $\ddot{R} =$ Al. Be

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 233. | **Tephroite** * | $\dot{M}n^3\,\ddot{S}i$ | 2? |
| 234. | **Knebelite** | $(\dot{F}e, \dot{M}n)^3\,\ddot{S}i$ | |
| 235. | **Chondrodite** * | * $\dot{M}g^4\,\ddot{S}i$ | 3 |
| 336. | **Willemite** * | $\dot{Z}n^3\,\ddot{S}i$ | 6 |
| 237. | **Phenacite** * | $\ddot{B}e\,\ddot{S}i$ | 6 |
| 238. | **Garnet** | $\dot{R}^3\,\ddot{S}i + \ddot{R}\,\ddot{S}i$ | 1 |
| | 238a. Pyrope * | $(\dot{C}a, \dot{M}g)^3\,\ddot{S}i + (\ddot{A}l, \ddot{F}e)\,\ddot{S}i$ | |
| | 238b. Grossular * | $\dot{C}a^3\,\ddot{S}i + \ddot{A}l\,\ddot{S}i$ | |
| | 238c. Almandine * | $\dot{F}e^3\,\ddot{S}i + \ddot{A}l\,\ddot{S}i$ | |
| | 238d. Spessartine * | $\dot{M}n^3\,\ddot{S}i + \ddot{A}l\,\ddot{S}i$ | |
| | 238e. Melanite * | $\dot{C}a^3\,\ddot{S}i + \ddot{F}e\,\ddot{S}i$ | |
| | 238f. Ouvarovite | $\dot{C}a^3\,\ddot{S}i + (\ddot{C}r\,\ddot{A}l)\,\ddot{S}i$ | |
| 239. | **Helvin** | $(\dot{M}n, \dot{F}e)^3\,\ddot{S}i^2 + \ddot{B}e\,\ddot{S}i + Mn\,S$ | 1 |
| 240. | **Zircon** * | $\ddot{Z}r\,\ddot{S}i$ | 2 |
| 241. | **Auerbachite** | $\ddot{Z}r\frac{1}{2}\,\ddot{S}i\frac{3}{4}$ | 2 |
| 242. | **Alvite** ? | $\ddot{T}h?, \dot{Y}, \ddot{Z}r, \ddot{F}e, \ddot{A}l, \ddot{B}e, \ddot{S}i, \dot{H}$ | 2 |
| 243. | **Tachyaphaltite** | $\ddot{T}h?, \ddot{A}l, \ddot{F}e, \ddot{Z}r, \ddot{S}i, \dot{H}$ | 2 |
| 244. | **Idocrase** * | $(\dot{C}a, \dot{M}g, \dot{F}e)^3\,\ddot{S}i + \ddot{A}l\,\ddot{S}i$ | 2 |
| 245. | **Sarcolite** | $(\dot{C}a, \dot{N}a)^3\,\ddot{S}i + \ddot{A}l\,\ddot{S}i$ | 2 |
| 246. | **Meionite** | $\dot{C}a^3\,\ddot{S}i + 2\ddot{A}l\,\ddot{S}i$ | 2 |
| 247. | **Scapolite** * | $\dot{C}a^3\,\ddot{S}i^2 + 2\ddot{A}l\,\ddot{S}i$ | 2 |
| 248. | **Mellilite** | $2(\dot{C}a, \dot{N}a, \dot{M}g)^3\,\ddot{S}i + (\ddot{A}l, \ddot{F}e)\,\ddot{S}i$ | 2 |
| 249. | **Dipyre** | $4(\dot{C}a, \dot{N}a)\,\ddot{S}i + 3\ddot{A}l\,\ddot{S}i$ | 2 |

* Part of the oxygen is replaced by fluorine in varying proportions.

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 250. | **Epidote** | $\dot{R}^3\ddot{S}i + 2\ddot{R}\ddot{S}i$ | 5 |
| | 250a. Pistacite * | $(\dot{C}a, \dot{F}e)^3\ddot{S}i + 2\ddot{A}l\ddot{S}i$ | |
| | 250b. Zoisite * | $\dot{C}a^3\ddot{S}i + 2\ddot{A}l\ddot{S}i$ | |
| | 250c. Piedmontite | $\dot{C}a^3\ddot{S}i + 2(\ddot{A}l, \ddot{M}n)\ddot{S}i$ | |
| 251. | **Allanite** * | * $\dot{R}^3\ddot{S}i + \ddot{R}\ddot{S}i$ | 4 |
| 252. | **Partschin** | $(\dot{F}e, \dot{M}n)^3\ddot{S}i + \ddot{A}l\ddot{S}i$ | 4 |
| 253. | **Zoisite** *Brooke* | $\dot{C}a^3\ddot{S}i + 2\ddot{A}l\ddot{S}i$ | 4 |
| 254. | **Gadolinite** | † $(\dot{R}^3, \ddot{R})\ddot{S}i_4^3$ | 4 |
| 255. | **Danburite** † | $\dot{C}a^3\ddot{S}i + 3\ddot{B}\ddot{S}i$ | 5 |
| 256. | **Axinite** * | ‡ $(\dot{R}^3, \ddot{R}, \ddot{B})\ddot{S}i$ | 5 |
| 257. | **Iolite** * | $(\dot{M}g, \dot{F}e)^3\ddot{S}i^2 + 3\ddot{A}l\ddot{S}i$ | 3 |
| | | 5. *Mica Section.* | |
| 258. | **Muscovite** * | § $(\frac{1}{19}\dot{K}^3 + \frac{12}{19}\ddot{R})\ddot{S}i_4^5$ | 3 |
| 259. | **Phlogopite** * | $3(\dot{K}, \dot{M}g)^3\ddot{S}i + 2\ddot{A}l\ddot{S}i$ | 3 |
| 260. | **Biotite** * | $(\dot{K}, \dot{M}g)^3\ddot{S}i + (\ddot{A}l, \ddot{F}e)\ddot{S}i$ | 3? |
| 261. | **Astrophyllite** | $\dot{K}, \dot{N}a, \dot{C}a, \dot{F}e, \dot{M}n, \ddot{T}i, \ddot{A}l, \ddot{Z}r, \ddot{F}e, \ddot{S}i$ | |
| 262. | **Lepidomelane** | $(\dot{K}, \dot{F}e)^3\ddot{S}i + 3(\ddot{A}l, \ddot{F}e)\ddot{S}i$ | 3? |
| 263. | **Lepidolite** * | $(\dot{K}, \dot{L}i)\ddot{S}i + (\ddot{A}l, \ddot{F}e)\ddot{S}i$ | 3 |
| | | 6. *Feldspar Section.* | |
| 264. | **Sodalite** * | $\dot{N}a^3\ddot{S}i + 3\ddot{A}l\ddot{S}i + Na\,Cl$ | 1 |
| 265. | **Lapis Lazuli** | $\dot{N}a, \dot{C}a, \ddot{A}l, \ddot{F}e, \ddot{S}i, \ddot{S}$ | 1 |
| 266. | **Häuyne** | $\dot{N}a^3\ddot{S}i + 3\ddot{A}l\ddot{S}i + 2\dot{C}a\ddot{S}$ | 1 |
| 267. | **Nosean** | $\dot{N}a^3\ddot{S}i + 3\ddot{A}l\ddot{S}i + \dot{N}a\ddot{S}$ | 1 |
| 268. | **Skolopsite** | ‖ $\dot{R}^3\ddot{S}i^2 + \ddot{A}l\ddot{S}i + \frac{1}{3}\dot{N}a\ddot{S}$ | |

* $\dot{R}$ = Ca. Ce. La. Di. Fe. Mg. $\ddot{R}$ = Al Fe
† $\dot{R}$ = Ca. Ce. Fe. Y. $\ddot{R}$ = Be.
‡ $\dot{R}$ = Ca. $\ddot{R}$ = Al. Fe. Mn.
§ $\ddot{R}$ = Al. Fe.
‖ $\dot{R}$ = Na. Ka. Ca. Mg. Mn.

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 269. | **Leucite** | $\dot{K}^3\ddot{S}i^2 + 3\ddot{A}l\ddot{S}i^2$ | 1 |
| 270. | **Nepheline** * | $(\dot{N}a, \dot{K})^2\ddot{S}i + 2\ddot{A}l\ddot{S}i$ | 6 |
| 271. | **Cancrinite** * | $\dot{N}a^2\ddot{S}i + 2\ddot{A}l\ddot{S}i + (\dot{N}a, \dot{C}a)\ddot{C} + \dot{H}$ | 6 |
| 272. | **Anorthite** | $(\dot{N}a, \dot{K}, \dot{C}a, \dot{M}g)^3\ddot{S}i + 3\ddot{A}l\ddot{S}i$ | 5 |
| 273. | **Andesine** * | $(\dot{C}a, \dot{N}a)^3\ddot{S}i^2 + 3\ddot{A}l\ddot{S}i^2$ | 5 |
| 274. | **Barsowite** | $\dot{C}a^3\ddot{S}i^2 + 3\ddot{A}l\ddot{S}i$ | 5? |
| 275. | **Bytownite?** | $\dot{C}a^3\ddot{S}i^2 + 3\ddot{A}l\ddot{S}i$ | |
| 276. | **Labradorite** * | $(\dot{C}a, \dot{N}a)\ddot{S}i + \ddot{A}l\ddot{S}i$ | 5 |
| 277. | **Oligoclase** * | $(\dot{C}a, \dot{N}a)\ddot{S}i + \ddot{A}l\ddot{S}i^2$ | 5 |
| 278. | **Albite** * | $\dot{N}a\ddot{S}i + \ddot{A}l\ddot{S}i^3$ | 5 |
| 279. | **Orthoclase** * | $\dot{K}\ddot{S}i + \ddot{A}l\ddot{S}i^3$ | 4 |
| 280. | **Petalite** * | $(\dot{L}i, \dot{N}a)^3\ddot{S}i^4 + 4\ddot{A}l\ddot{S}i^4$ | 5? |
| | | *Appendix.* | |
| 281. | **Cyclopite** | $(\dot{C}a, \dot{N}a)^3\ddot{S}i + 2(\ddot{A}l, \ddot{F}e)\ddot{S}i$ | 5 |
| 282. | **Weissigite?** | $\dot{N}a, \dot{K}, \dot{L}i, \ddot{A}l, \ddot{S}i$ | 4 |
| 283. | **Pollux** | $\dot{K}, \dot{N}a, \ddot{A}l, \ddot{F}e, \ddot{S}i$ | |
| 284. | **Isopyre** | $\dot{C}a\ddot{S}i + (\ddot{A}l, \ddot{F}e)\ddot{S}i$ | |
| 285. | **Silicate of Yttria?** | $\dot{Y}, \ddot{S}i$ | |
| 286. | **Polychroilite** | $\dot{M}g, \ddot{A}l, \ddot{F}e, \ddot{S}i, \dot{H}$ | 6? |
| | | 7. *Andalusite Section.* | |
| 287. | **Gehlenite** | $3(\dot{M}g, \dot{C}a)^3\ddot{S}i + (\ddot{F}e, \ddot{A}l)^3\ddot{S}i$ | 2 |
| 288. | **Andalusite** * | $*\ \ddot{A}l\ddot{S}i^{\frac{3}{4}}$ | 3 |
| 289. | **Topaz** * | $*\ \ddot{A}l\ddot{S}i^{\frac{3}{4}}$ | 3 |
| 290. | **Staurotide** * | $\dagger\ (\ddot{A}l, \ddot{F}e)\ddot{S}i^{\frac{3}{4}}$ | 3 |
| 291. | **Carolathine** | $\ddot{A}l\ddot{S}i^{\frac{3}{4}}$ | |

* And $\ddot{A}l\ddot{S}i^{\frac{3}{4}}$. In Topaz part of the oxygen is replaced by fluorine.
† And $\ddot{A}l\ddot{S}i^{\frac{1}{2}}$. Rammelsberg writes the formula $(\dot{R}, \ddot{R}^2) + \ddot{S}i^n$.

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 292. | **Lievrite** * | $3(\dot{F}e, \dot{C}a)^3 \ddot{S}i + \dot{F}e^2 \ddot{S}i$ | 3 |
| 293. | **Kyanite** * | $\ddot{A}l \ddot{S}i^{\frac{2}{3}}$ | 5 |
| 294. | **Sillimanite** * | * $\ddot{A}l \ddot{S}i^{\frac{2}{3}}$ | 3 |
| 295. | **Sapphirine** | $\dot{M}g, \dot{F}e, \ddot{A}l, \ddot{S}i$ | 3? |
| 296. | **Euclase** | $(\frac{1}{2}\ddot{B}e + \frac{1}{2}\ddot{A}l) \ddot{S}i^{\frac{3}{4}}$ | 4 |
| 297. | **Sphene** * | $(\dot{C}a, \dot{T}i) \ddot{S}i^{\frac{3}{5}}$ | 4 |
| 298. | **Keilhauite** | $(\dot{Y}, (\dot{C}a, \dot{T}i), \ddot{A}l, \dot{F}e, \dot{M}n, \dot{E}r) \ddot{S}i^{\frac{3}{5}}$ | 4 |
| 299. | **Tourmaline** * | † $(\dot{R}^3, \ddot{R}, \ddot{B}) Si^{\frac{3}{4}}$ | 6 |

## B. Hydrous Silicates.

### I. Magnesian Hydrous Silicates.

#### 1. *Talc Section.*

| | | | |
|---|---|---|---|
| 300. | **Talc** * | $\dot{M}g^6 \ddot{S}i^5 + 2\dot{H}$ | 3? |
| 301. | **Meerschaum** | $\dot{M}g \ddot{S}i + \dot{H}$? | |
| 302. | **Neolite** | $(\dot{F}e, \dot{M}g) \ddot{S}i + \frac{1}{3}\dot{H}$? | |
| 303. | **Spadaite** | $\dot{M}g^5 \ddot{S}i^4 + 4\dot{H}$ | |
| 304. | **Chlorophæite** | $\dot{F}e \ddot{S}i + 6\dot{H}$? | |
| 305. | **Crocidolite** | $(\dot{N}a, \dot{M}g, \dot{F}e)^6 \ddot{S}i^5 + 2\dot{H}$ | 4? |

#### 2. *Serpentine Section.*

| | | | |
|---|---|---|---|
| 306. | **Picrophyll** | $(\dot{M}g, \dot{F}e)^3 \ddot{S}i^2 + 2\dot{H}$ | 6? |
| 307. | **Kerolite** * | $\dot{M}g^3 \ddot{S}i^2 + 4\frac{1}{2}\dot{H}$ | |
| 308. | **Monradite** | $(\dot{M}g, \dot{F}e)^3 \ddot{S}i^2 + \frac{3}{4}\dot{H}$ | |
| 309. | **Aphrodite** | $\dot{M}g^3 \ddot{S}i^2 + 2\frac{1}{4}\dot{H}$ | |
| 310. | **Picrosmine** | $\dot{M}g^3 \ddot{S}i^2 + 1\frac{1}{2}\dot{H}$ | 3 |
| 311. | **Saponite** * | $2\dot{M}g^3 \ddot{S}i^2 + \ddot{A}l \ddot{S}i + 10\dot{H}$ | |

* And $\ddot{A}l \ddot{S}i^{\frac{3}{4}}$.

† $\dot{R} = \dot{F}e.\ \dot{M}g.\ \dot{C}a.\ \dot{N}a.\quad \ddot{R} = \ddot{A}l.\ \ddot{F}e.$

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 312. | **Serpentine** * | $\dot{M}g^3\ddot{S}i^4 + 6\dot{H}$ | 3 ? |
| 313. | **Deweylite** * | $\dot{M}g^2\ddot{S}i + 3\dot{H}$ | |
| 314. | **Hydrophite** * | $(\dot{M}g, \dot{F}e)^2\ddot{S}i + 3\dot{H}$ ? | |
| 315. | **Nickel Gymnite** * | $(\dot{N}i, \dot{M}g)^2\ddot{S}i + 3\dot{H}$ | |
| | | *Appendix.* | |
| 316. | **Ottrelite** * | $(\dot{F}e, \dot{M}n)^3\ddot{S}i^2 + 2\ddot{A}l\ddot{S}i + 3\dot{H}$ | 4? |
| 317. | **Groppite** | $(\dot{K}, \dot{C}a, \dot{M}g)^3\ddot{S}i^2 + 2\ddot{A}l\ddot{S}i + 3\dot{H}$ | |
| 318. | **Stilpnomelane** | $\ddot{F}e^3\ddot{S}i^2 + \ddot{A}l\ddot{S}i^2 + 7\dot{H}$ | |
| 319. | **Chalcodite** † | $2(\dot{F}e, \dot{M}g)\ddot{S}i + (\ddot{A}l, \ddot{F}e)\ddot{S}i + 3\dot{H}$ | |
| 320. | **Eukamptite** | $(\dot{M}g, \dot{F}e)^3\ddot{S}i + \ddot{A}l\ddot{S}i + \dot{H}$ | |
| 321. | **Melanhydrite** | $(\dot{M}g,\dot{F}e,\dot{M}n)^3\ddot{S}i^2 + 2(\ddot{A}l,\ddot{F}e)\ddot{S}i + 12\dot{H}$ | |
| | | 3. *Chlorite Section.* | |
| 322. | **Hisingerite** | $\dot{F}e^3\ddot{S}i + 2\ddot{F}e\ddot{S}i + 6\dot{H}$ | |
| 323. | **Thuringite** * | $2\dot{F}e^3\ddot{S}i + (\ddot{A}l, \ddot{F}e)^3\ddot{S}i + 6\dot{H}$ | |
| 324. | **Euphyllite** † | $(\dot{N}a, \dot{K}, \dot{C}a)^3\ddot{S}i + 8\ddot{A}l\ddot{S}i + 6\dot{H}$ | |
| 325. | **Pyrosclerite** * | $2\dot{M}g^3\ddot{S}i + \ddot{A}l\ddot{S}i + 6\dot{H}$ | 6 ? |
| 326. | **Pseudophite?** | $4(\dot{M}g, \dot{F}e)^3\ddot{S}i + \ddot{A}l^2\ddot{S}i + 9\dot{H}$ | |
| 327. | **Thermophyllite?** | $\dot{M}g^3\ddot{S}i^{\frac{2}{3}} + (\ddot{A}l, \ddot{F}e)\ddot{S}i^{\frac{2}{3}} + 2\dot{H}$ | |
| 328. | **Chlorite** | $5\ddot{R}^3\ddot{S}i^{\frac{3}{4}} + 3\ddot{R}\ddot{S}i^{\frac{3}{4}} + 12\dot{H}$ | 6 |
| | 328a. Chlorite * | $5(\dot{M}g, \dot{F}e)^3\ddot{S}i^{\frac{3}{4}} + 3\ddot{A}l\ddot{S}i^{\frac{3}{4}} + 12\dot{H}$ | |
| | 328b. Pennine | $5(\dot{M}g, \dot{F}e)^3\ddot{S}i^{\frac{3}{4}} + 3(\ddot{A}l, \ddot{F}e)\ddot{S}i^{\frac{3}{4}} + 12\dot{H}$ | |
| | 328c. Clinochlore * | $5\dot{M}g\ddot{S}i^{\frac{3}{4}} + 3\ddot{A}l\ddot{S}i^{\frac{3}{4}} + 12\dot{H}$ | |
| 329. | **Delessite** | $(\dot{M}g, \dot{F}e)^3\ddot{S}i^{\frac{3}{4}} + (\ddot{A}l, \ddot{F}e)\ddot{S}i^{\frac{3}{4}} + 3\dot{H}$ | 6? |
| 330. | **Ripidolite** *G. Rose* | $(\dot{M}g, \dot{F}e)^3\ddot{S}i^{\frac{2}{3}} + \ddot{A}l\ddot{S}i^{\frac{2}{3}} + 3\dot{H}$ | 6 |
| 331. | **Clintonite** * | $\dot{C}a, \dot{M}g, \dot{F}e, \ddot{A}l, \ddot{S}i, \dot{H}$ | |
| 332. | **Chloritoid** * | $(\dot{F}e, \dot{M}g)^3\ddot{S}i^{\frac{2}{3}} + 2\ddot{A}l\ddot{S}i^{\frac{2}{3}} + 3\dot{H}$ | |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 333. | **Cronstedtite** | $(\dot{M}g, \dot{F}e, \dot{M}n)^3\,\ddot{S}i_{\frac{1}{2}} + \dot{F}e\,\ddot{S}i_{\frac{1}{2}} + 3\dot{H}$ | 6 |
| 334. | **Sideroschisolite** | $\dot{F}e^3\,\ddot{S}i_{\frac{1}{2}} + \frac{1}{2}\dot{H}$ | 6 |
| 335. | **Margarite** * | $(\dot{N}a, \dot{C}a)^3\,\ddot{S}i + 3\ddot{A}l^2\,\ddot{S}i + 3\dot{H}$ | 3 |
| 336. | **Ephesite** | $\dot{N}a, \dot{K}, \dot{C}a, \ddot{A}l, \ddot{S}i, \dot{H}$ | |

## II. Non-Magnesian Hydrous Silicates.

### 1. *Pyrophyllite Section.*

| | | | |
|---|---|---|---|
| 337. | **Pyrophyllite** * | $\ddot{A}l\,\ddot{S}i^3 + 1\frac{1}{2}\dot{H}$ | 3 |
| 338. | **Pholerite** * | $\ddot{A}l^3\,\ddot{S}i^4 + 6\dot{H}$ | |
| 339. | **Anthosiderite** | $\ddot{F}e\,\ddot{S}i^3 + \dot{H}$ | |

### 2. *Pectolite Section.*

| | | | |
|---|---|---|---|
| 340. | **Apophyllite** * | $(\dot{C}a, \dot{K})^3\,\ddot{S}i^2 + 2\dot{H}$ | 2 |
| 341. | **Pectolite** * | $(\dot{C}a, \dot{N}a)^4\,\ddot{S}i^3 + \dot{H}$ | 4 |
| 342. | **Okenite** | $\dot{C}a^3\,\ddot{S}i^4 + 6\dot{H}$ | 3? |
| 343. | **Laumontite** * | $\dot{C}a^3\,\ddot{S}i^2 + 3\ddot{A}l\,\ddot{S}i^2 + 12\dot{H}$ | 4 |
| 344. | **Leonhardite** * | $\dot{C}a^3\,\ddot{S}i^2 + 3\ddot{A}l\,\ddot{S}i^2 + 9\dot{H}$ | 4 |
| 345. | **Catapleiite** | $(\dot{N}a, \dot{C}a)^3\,\ddot{S}i^2 + 2\ddot{Z}r\,\ddot{S}i^2 + 6\dot{H}$ | 6 |
| 346. | **Dioptase** | $\dot{C}u^3\,\ddot{S}i^2 + 3\dot{H}$ | 6 |
| 347. | **Chrysocolla** * | $\dot{C}u^4\,\ddot{S}i^2 + 6\dot{H}$ | |
| 348. | **Demidoffite** | $\dot{C}u, \ddot{S}i, \dot{H}$ | |
| 349. | **Pyrosmalite** | $*\,4(\dot{R}^3\,\ddot{S}i + 2\dot{R}^3\,\ddot{S}i^2 + 6\dot{H}) + 3FeCl$ | 6 |
| 350. | **Portite** | $\ddot{A}l\,\ddot{S}i^2 + 2\dot{H}$ | 3 |

### 3. *Calamine Section.*

| | | | |
|---|---|---|---|
| 351. | **Tritomite** | † $\ddot{R}\,\ddot{S}i + 2\dot{H}$ ? | 1 |
| 352. | **Thorite** | $\dot{T}h^3\,\ddot{S}i + 3\dot{H}$ | 2 |
| 353. | **Cerite** | $(\dot{C}e, \dot{L}a, \dot{D}i)^3\,\ddot{S}i + \dot{H}$ | 6 |

* $\dot{R} = \dot{F}e, \dot{M}n.$ † $\ddot{R} = \ddot{C}e.\ \ddot{L}a.$

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 354. | **Calamine *** | $\dot{Z}n^3\ddot{S}i + 1\frac{1}{2}\dot{H}$ | 3 |
| 355. | **Prehnite *** | $\dot{C}a^2\ddot{S}i + \ddot{A}l\ddot{S}i + \dot{H}$ | 3 |
| 356. | **Chlorastrolite †** | $(\dot{C}a, \dot{N}a)^3\ddot{S}i + 2(\ddot{A}l, \ddot{F}e)\ddot{S}i + 3\dot{H}$ | |
| 357. | **Savite** | $(\dot{N}a, \dot{M}g)^3\ddot{S}i^2 + \ddot{A}l\ddot{S}i + 2\dot{H}$ | 3 |
| 358. | **Schneiderite** | $3(\dot{C}a, \dot{M}g)^3\ddot{S}i^2 + \ddot{A}l^3\ddot{S}i^2 + 3\dot{H}$ | |
| 359. | **Carpholite** | $(\ddot{A}l, \ddot{F}e, \ddot{M}n)\ddot{S}i + 1\frac{1}{2}\dot{H}$ | 3 |
| | | 4. *Zeolite Section.* | |
| 360 | **Analcime *** | $\dot{N}a^3\ddot{S}i^2 + 3\ddot{A}l\ddot{S}i^2 + 6\dot{H}$ | 1 |
| 361. | **Ittnerite** | $(\dot{N}a, \dot{C}a)^3\ddot{S}i + 3\ddot{A}l\ddot{S}i + 6\dot{H}$ | 1 |
| 362. | **Faujasite** | $(\dot{N}a, \dot{C}a)\ddot{S}i + \ddot{A}l\ddot{S}i^2 + 9\dot{H}$ | 1 |
| 363. | **Chabazite *** | $(\dot{C}a, \dot{N}a, \dot{K})^3\ddot{S}i^2 + 3\ddot{A}l\ddot{S}i^2 + 18\dot{H}$ | 6 |
| 364. | **Gmelinite** | $(\dot{C}a, \dot{N}a, \dot{K})^3\ddot{S}i^2 + 3\ddot{A}l\ddot{S}i^2 + 18\dot{H}$ | 6 |
| 365. | **Levyne** | $\dot{C}a\ddot{S}i + \ddot{A}l\ddot{S}i + 4\dot{H}$ | 6 |
| 366. | **Gismondine** | $(\dot{C}a, \dot{K})^2\ddot{S}i + 2\ddot{A}l\ddot{S}i + 9\dot{H}$ | 2 |
| 367. | **Edingtonite** | $3\dot{B}a\ddot{S}i + 4\ddot{A}l\ddot{S}i + 12\dot{H}$ | 2 |
| 368. | **Harmotome** | $\dot{B}a\ddot{S}i + \ddot{A}l\ddot{S}i^2 + 5\dot{H}$ | 3 |
| 369. | **Phillipsite** | $(\dot{C}a, \dot{K})\ddot{S}i + \ddot{A}l\ddot{S}i^2 + 5\dot{H}$ | 3 |
| 370. | **Thomsonite *** | $(\dot{C}a, \dot{N}a)^3\ddot{S}i + 3\ddot{A}l\ddot{S}i + 7\dot{H}$ | 3 |
| 371. | **Natrolite *** | $\dot{N}a\ddot{S}i + \ddot{A}l\ddot{S}i + 2\dot{H}$ | 3 |
| 372. | **Scolecite** | $\dot{C}a\ddot{S}i + \ddot{A}l\ddot{S}i + 3\dot{H}$ | 4 |
| 373. | **Ellagite** | $\dot{C}a^3\ddot{S}i^4 + \ddot{A}l\ddot{S}i + 12\dot{H}$ | 4? |
| 374. | **Sloanite** | $(\dot{C}a, \dot{M}g)^7\ddot{S}i^2 + 5\ddot{A}l\ddot{S}i + 9\dot{H}$ | 3 |
| 375. | **Epistilbite** | $(\dot{C}a, \dot{N}a)\ddot{S}i + \ddot{A}l\ddot{S}i^3 + 5\dot{H}$ | 3 |
| 376. | **Heulandite *** | $\dot{C}a\ddot{S}i + \ddot{A}l\ddot{S}i^3 + 5\dot{H}$ | 4 |
| 377. | **Brewsterite** | $(\dot{S}r, \dot{B}a)\ddot{S}i + \ddot{A}l\ddot{S}i^3 + 5\dot{H}$ | 4 |
| 378. | **Stilbite *** | $\dot{C}a\ddot{S}i + \ddot{A}l\ddot{S}i^3 + 6\dot{H}$ | 3 |
| 379. | **Caporcianite** | $\dot{C}a^3\ddot{S}i^2 + 3\ddot{A}l\ddot{S}i^2 + 9\dot{H}$ | 4 |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| | | 5. *Datholite Section.* | |
| 380. | **Datholite** * | $2\dot{C}a^3\ddot{S}i + \ddot{B}^3\ddot{S}i^2 + 3\dot{H}$ | 4 |
| 381. | **Allophane** * | $\ddot{A}l^3\ddot{S}i^2 + 15\dot{H}$ | |
| 382. | **Schrötterite** * | $\ddot{A}l^4\ddot{S}i + 3\dot{H}$ | |
| | | *Appendix to Hydrous Silicates.* | |
| 383. | **Chloropal** | $\ddot{F}e\ddot{S}i^2 + 3\dot{H}$ | |
| 384. | **Collyrite** | $\ddot{A}l^3\ddot{S}i + 15\dot{H}$ | |
| 385. | **Wolchonskoite** | $*\ \ddot{R}\ddot{S}i + 2\frac{1}{4}\dot{H}$ ? | |
| 386. | **Chrome Ochre** | $(\ddot{A}l, \ddot{C}r)^3\ddot{S}i^4 + 4\dot{H}$ | |
| 387. | **Pimelite** | $(\dot{N}i, \dot{M}g)^3\ddot{S}i + 2(\ddot{A}l, \ddot{F}e)\ddot{S}i + 9\dot{H}$ | |
| 388. | **Montmorillonite** | $\dot{C}a, \dot{K}, \ddot{A}l, \ddot{F}e, \ddot{S}i, \dot{H}$ | |
| 389. | **Delanovite** ? | $\dot{M}n^3\ddot{S}i^2 + 2\ddot{A}l\ddot{S}i^2 + 45\dot{H}$ | |
| 390. | **Erdmanite** | $\dot{C}a, \dot{F}e, \dot{M}n, \dot{Y}, \dot{C}e, \dot{L}a, \ddot{A}l, \ddot{S}i, \dot{H}$ | |
| 391. | **Bavalite** | $\dot{C}a, \dot{M}g, \ddot{A}l, \ddot{F}e, \ddot{S}i, \dot{H}$ | |
| | | C. Unarranged Silicates containing Titanic Acid. | |
| 392. | **Tscheffkinite** | $((\dot{C}a, \dot{T}i), \ddot{C}e, \ddot{L}a, \ddot{A}l)\ddot{S}i\frac{2}{3}$ | |
| 393. | **Schorlomite** † | $\dagger\ 2\dot{R}^3\ddot{S}i\frac{1}{2} + 3\ddot{R}\ddot{S}i\frac{1}{2}$ | 1 |
| 394. | **Mosandrite** | $\ddagger\ \dot{R}^3\ddot{S}i + 2\ddot{R}\ddot{S}i + 4\frac{1}{2}\dot{H}$ | 3 |
| 395. | **Wölherite** | $6(\dot{N}a, \dot{C}a)^3\ddot{S}i + 3\ddot{Z}r\ddot{S}i + \ddot{C}b\ddot{S}i$ | 3 |
| | | *Appendix.* | |
| 396. | **Turnerite** ? | $\dot{C}a, \dot{M}g, \ddot{A}l, \ddot{S}i$ ? | 4 |

* $\ddot{R} = \ddot{C}r.\ \ddot{A}l.\ \ddot{F}e.$

† $\dot{R} = \dot{C}a.\quad \ddot{R} = (\dot{C}a.\ \dot{T}i).\ \ddot{F}e.$

‡ $\dot{R} = \dot{C}a.\quad \ddot{R} = (\dot{C}a.\ \dot{T}i).\ \ddot{C}e.\ \ddot{D}.\ \ddot{L}a.$

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|

## 2. Titanates, Tungstates, Molybdates, Tantalates, Columbates, Chromates, Vanadates.

| | | | |
|---|---|---|---|
| 397. | **Perofskite** | Ca Ti | 1 |
| 398. | **Pyrochlore** * | 4(Ca, Mg, Ce, La, Y, U) (Ti, Cb) | 1 |
| 399. | **Pyrrhite** | Ce, Zr, Cb | 1 |
| 400. | **Scheelite** * | Ca W | 2 |
| 401. | **Scheeletine** * | Pb W | 2 |
| 402. | **Tungstate of Copper?** † | Cu, Ca, W | |
| 403. | **Wulfenite** * | Pb Mo | 2 |
| 404. | **Azorite** | Ca, Cb | 2 |
| 405. | **Fergusonite** | (Y, Ce)$^6$ Cb | 2 |
| 406. | **Tyrite?** | Y, Ce, Fe, U, Al, Cb | 2 |
| 407. | **Adelpholite** | Fe, Mn Ta | 2 |
| 408. | **Tantalite** | (Fe, Mn) Ta | 3 |
| 409. | **Wolfram** * | 2FeW+3MnW and 4FeW+MnW | 3 |
| 410. | **Columbite** * | (Fe, Mn) Cb | 3 |
| 411. | **Paracolumbite?** † | Fe, U, and a metallic acid. | |
| 412. | **Samarskite** * | Y, Ce, La, Fe, U, Cb | 3 |
| 413. | **Mengite** | Fe, Zr, Ti | 3 |
| 414. | **Polymignyte** * | Y, Ti, Zr, Fe, Ce, | 3 |
| 415. | **Polycrase** | U, Ti, Zr, Fe, Ce, Cb | 3 |
| 416. | **Æschynite** | 2(Ce, La, Y, Fe) Cb + Ce, Ti$^3$ | 3 |
| 417. | **Euxenite** | Ca, Mg, Y, Ce, La, U, Ti, Cb | 3? |
| 418. | **Yttro-Tantalite** | * R$^3$ (Ta, W, U) | 3 |
| 419. | **Parathorite** † | Fe, Ti? | 3 |
| 420. | **Rutherfordite** † | Ce, Y, Ca, Ti | 4 |

* In the yellow R = Y. In the black R = Y, Ca, Fe. In the brown R = Y, Ca.

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 421. | **Crocoisite** | $\dot{P}b\,\ddot{C}r$ | 4 |
| 422. | **Vauquelinite** * | $(\dot{C}u, \dot{P}b)^3\,\ddot{C}r^2$ | 4 |
| 423. | **Melanochroite** | $\dot{P}b^3\,\ddot{C}r^2$ | 3? |
| 424. | **Dechenite** | $2(\dot{P}b, \dot{Z}n)^3\,\ddot{V} + (\dot{P}b, \dot{Z}n)^3\,\ddot{A}s$ | |
| 425. | **Descloizite** | $\dot{P}b^2\,\ddot{V}$ | 3 |
| 426. | **Vanadinite** | $\dot{P}b^3\,\ddot{V} + \frac{1}{3}Pb\,Cl$ | 6 |
| 427. | **Volborthite** | $(\dot{C}u, \dot{C}a)^4\,\ddot{V} + \dot{H}$ | 6 |
| 428. | **Pateraite?** | $\dot{C}u, \dot{C}o, \ddot{V}$ | |

## 3. Sulphates and Selenates.

### 1. Anhydrous Sulphates.

#### 1. *Trimetric.*

| | | | |
|---|---|---|---|
| 429. | **Glaserite** | $\dot{K}\,\ddot{S}$ | 3 |
| 430. | **Thenardite** | $\dot{N}a\,\ddot{S}$ | 3 |
| 431. | **Barytes** * | $\dot{B}a\,\ddot{S}$ | 3 |
| 432. | **Celestine** * | $\dot{S}r\,\ddot{S}$ | 3 |
| 433. | **Anhydrite** * | $\dot{C}a\,\ddot{S}$ | 3 |
| 434. | **Anglesite** * | $\dot{P}b\,\ddot{S}$ | 3 |
| 435. | **Almagrerite** | $\dot{Z}n\,\ddot{S}$ | 3 |
| 436. | **Leadhillite** * | $\dot{P}b\,\ddot{S} + 3\dot{P}b\,\ddot{C}$ | 3 |
| 437. | **Caledonite** * | $\dot{P}b\,\ddot{S}, \dot{P}b\,\ddot{C}, \dot{C}u\,\ddot{C}$ | 3 |

#### 2. *Rhombohedral.*

| | | | |
|---|---|---|---|
| 438. | **Dreelite** | $\dot{C}a\,\ddot{S} + 3\dot{B}a\,\ddot{S}$ | 6 |
| 439. | **Susannite** | $\dot{P}b\,\ddot{S} + 3\dot{P}b\,\ddot{C}$ | 6 |

#### 3. *Monoclinic.*

| | | | |
|---|---|---|---|
| 440. | **Glauberite** | $(\frac{1}{2}\dot{N}a + \frac{1}{2}\dot{C}a)\,\ddot{S}$ | 4 |
| 441. | **Lanarkite** | $\dot{P}b\,\ddot{S} + \dot{P}b\,\ddot{C}$ | 4 |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| | *Appendix to Anhydrous Sulphates.* | | |
| 442. | **Reussin** | $\dot{N}a\,\ddot{S}, \dot{M}g\,\ddot{S}, Ca\,Cl$ | |
| 443. | **Selenate of Lead** | $\dot{P}b\,\ddot{S}e$ | 1? |
| 444. | **Connellite** | $\dot{C}u\,\ddot{S}, Cu\,Cl$? | 6 |
| 445. | **Alumian** | $\ddot{A}l\,\ddot{S}^2$ | 6? |
| | 2. Hydrous Sulphates. | | |
| 446. | **Misenite** | $\dot{K}\,\ddot{S} + \dot{H}\,\ddot{S}$ | |
| 447. | **Polyhalite** | $(\dot{K}, \dot{C}a, \dot{M}g)\,\ddot{S} + \frac{1}{2}\dot{H}$ | 3 |
| 448. | **Gypsum** * | $\dot{C}a\,\ddot{S} + 2\dot{H}$ | 4 |
| 449. | **Astrakanite** | $\dot{N}a\,\ddot{S} + \dot{M}g\,\ddot{S} + 4\dot{H}$ | |
| 450. | **Löweite** | $\dot{N}a\,\ddot{S} + \dot{M}g\,\ddot{S} + 2\frac{1}{2}\dot{H}$ | |
| 451. | **Mascagnine** | $\dot{N}H^4\,\ddot{S} + \dot{H}$ | 3 |
| 452. | **Lecontite** | $(\dot{N}a, \dot{N}H^4)\,\ddot{S} + 2\dot{H}$ | 3 |
| 453. | **Coquimbite** | $\ddot{F}e\,\ddot{S}^3 + 9\dot{H}$ | 6 |
| 454. | **Rœmerite** | $(\dot{F}e, \dot{Z}n)\,\ddot{S} + \ddot{F}e\,\ddot{S}^3 + 12\dot{H}$ | 4 |
| 455. | **Cyanosite** * | $\dot{C}u\,\ddot{S} + 5\dot{H}$ | |
| 456. | **Cyanochrome** | $(\frac{1}{2}\dot{K} + \frac{1}{2}\dot{C}u)\,\ddot{S} + 3\dot{H}$ | 4 |
| 457. | **Picromerid** | $(\dot{M}g, \dot{C}u)\,\ddot{S} + 3\dot{H}$ | 4 |
| 458. | **Alunogen** * | $\ddot{A}l\,\ddot{S}^3 + 18\dot{H}$ | |
| 459. | **Alum** | $\dot{R}\,\ddot{S} + \ddot{A}l\,\ddot{S}^3 + 24\dot{H}$ | 1 |
| | 459a. Potash Alum * | $\dot{K}\,\ddot{S} +$ " " | |
| | 459b. Solfatarite | $\dot{N}a\,\ddot{S} +$ " " | |
| | 459c. Tschermigite | $\dot{N}H^4\,\ddot{S} +$ " " | |
| | 459d. Pickeringite | $\dot{M}g\,\ddot{S} +$ " " | |
| | 459e. Halotrichite * | $\dot{F}e\,\ddot{S} +$ " " | |
| | 459f. Apjohnite * | $\dot{M}n\,\ddot{S} +$ " " | |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 460. | Voltaite | $\dot{F}e\,\ddot{S} + \ddot{F}e\,\ddot{S}^3 + 24\dot{H}$ | 1 |
| 461. | Epsomite * | $\dot{M}g\,\ddot{S} + 7\dot{H}$ | 3 |
| 462. | Tauriscite ? | $\dot{F}e\,\ddot{S} + 7\dot{H}$ | 3 |
| 463. | Mangan Vitriol ? | $\dot{M}n, \ddot{S}, \dot{H}$ | |
| 464. | Goslarite | $\dot{Z}n\,\ddot{S} + 7\dot{H}$ | |
| 465. | Copperas * | $\dot{F}e\,\ddot{S} + 7\dot{H}$ | 4 |
| 466. | Bieberite | $(\dot{C}o, \dot{M}g)\,\ddot{S} + 7\dot{H}$ | 4 |
| 467. | Pyromeline * | $\dot{N}i, \ddot{S}, \dot{H}$ | 6? |
| 468. | Morenosite | $\dot{N}i, \ddot{S}, \dot{H}$ | |
| 469. | Johannite | $2(\dot{U}\,\ddot{U})\,\ddot{S} + (\dot{C}u\,\ddot{S}) + 4\dot{H}$ | 4 |
| 470. | Basic Sulphate of Uranium | $2(\dot{U}\,\ddot{U})^3\,\ddot{S}^2 + \dot{C}a, \dot{C}u)\,\ddot{S} + 10\dot{H}$ | |
| 471. | Glauber Salt * | $\dot{N}a\,\ddot{S} + 10\dot{H}$ | 4 |
| 472. | Botryogen | $\dot{F}e^3\,\ddot{S}^2 + 3\ddot{F}e\,\ddot{S}^2 + 36\dot{H}$ | 4 |
| 473. | Copiapite | $\ddot{F}e^2\,\ddot{S}^5 + 18\dot{H}$ | |
| 474. | Apatelite | $2\ddot{F}e^2\,\ddot{S}^3 + 3\dot{H}$ | |
| 475. | Alunite * | $\dot{K}\,\ddot{S} + 3\ddot{A}l\,\ddot{S} + 6\dot{H}$ | 6 |
| 476. | Jarosite | $\dot{K}\,\ddot{S} + 4\ddot{F}e\,\ddot{S} + 9\dot{H}$ | 6 |
| 477. | Websterite | $\ddot{A}l\,\ddot{S} + 9\dot{H}$ | |
| 478. | Loewigite | $\dot{K}\,\ddot{S} + 3\ddot{A}l\,\ddot{S} + 9\dot{H}$ | |
| 479. | Pissophane | $(\ddot{F}e, \ddot{A}l)^5\,\ddot{S}^2 + 30\dot{H}$ | |
| 480. | Linarite | $\dot{P}b\,\ddot{S} + \dot{C}u\,\dot{H}$ | 4 |
| 481. | Brochantite * | $\dot{C}u^4\,\ddot{S} + 3\dot{H}$ | 3 |
| 482. | Lettsomite | $(\dot{C}u^6\,\ddot{S} + 3\dot{H}) + (\ddot{A}l\,\ddot{S} + 9\dot{H})$ | |
| 483. | Medjidite | $\ddot{U}\,\ddot{S} + \dot{C}a\,\ddot{S} + 15\dot{H}$ | |
| 484. | Uranochre | $3\ddot{U}^3\ddot{S} + 14\dot{H}$ and $2\ddot{U}^3\ddot{S} + \dot{C}a\,\ddot{S} + 28\dot{H}$ | |
| 485. | Uranochalcite | $\dot{U}\,\ddot{U} + 2\dot{C}a\,\ddot{S} + \dot{C}u\,\ddot{S} + 18\dot{H}$ | |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| | | 4. Borates. | |
| 486. | **Boracite** | $2(\dot{M}g^3\ddot{B}^4) + Mg\,Cl$ | 1 |
| 487. | **Rhodizite** | $\dot{C}a^3\ddot{B}^4$ ? | 1 |
| 488. | **Hydroboracite** | $\dot{C}a^3\ddot{B}^4 + \dot{M}g^3\ddot{B}^4 + 18\dot{H}$ | |
| 489. | **Hayesine** | $\dot{C}a\,\ddot{B}^4 + 10\dot{H}$ | |
| 490. | **Boronatrocalcite** | $\dot{N}a\,\ddot{B}^4 + \dot{C}a^3\,\ddot{B}^5 + 12\dot{H}$ | |
| 491. | **Borax** * | $\dot{N}a\,\ddot{B}^2 + 10\dot{H}$ | 4 |
| 492. | **Lagonite** | $\dot{F}e\,\ddot{B}^3 + 3\dot{H}$ | |
| 493. | **Larderellite** | $\dot{N}H^4\,\ddot{B}^4 + 4\dot{H}$ | |
| 494. | **Warwickite** † | $\dot{M}g, \dot{F}e, \dot{T}i, \ddot{B}$ | 4 |
| | | 5. Phosphates, Arsenates, Antimonates, Nitrates. | |
| | | *a.* Anhydrous. | |
| | | 1. *Hexagonal.* | |
| 495. | **Apatite** * | $\dot{C}a^3\ddot{P} + \frac{1}{3}Ca\,(Cl, F)$ | 6 |
| 496. | **Hydroapatite** | $\dot{C}a^3\ddot{P} + \frac{1}{3}Ca\,F + \dot{H}$ | |
| 497. | **Cryptolite** | $\dot{C}e^3\ddot{P}$ | 6 |
| 498. | **Pyromorphite** * | $\dot{P}b^3\ddot{P} + \frac{1}{3}Pb\,Cl$ | 6 |
| 499. | **Mimetene*** | $(\dot{P}b, \dot{C}a)^3\,(\ddot{A}s, \ddot{P}) + \frac{1}{3}Pb\,Cl$ | 6 |
| | | 2. *Dimetric.* | |
| 500. | **Xenotime** * | $(\dot{Y}, \dot{C}e)^1\ddot{P}$ | 2 |
| | | 3. *Monoclinic.* | |
| 501. | **Monazite** * | $(\dot{C}e, \dot{L}a, Th)^3\ddot{P}$ | 4 |
| 502. | **Wagnerite** | $\dot{M}g^3\ddot{P} + Mg\,F$ | 4 |
| 503. | **Kühnite** | $(\dot{C}a, \dot{M}g, \dot{M}n)^3\ddot{A}s$ | |
| 504. | **Lazulite** * | $2(\dot{M}g, \dot{F}e)^3\ddot{P} + \ddot{A}l^5\ddot{P}^3 + 5\dot{H}$ | 4 |
| 505. | **Turquois** * | $\ddot{A}l^2\ddot{P} + 5\dot{H}$ | |
| 506. | **Conarite** ? | $\dot{N}i, \ddot{P}, \dot{H}$ | 4? |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| | | 4. *Trimetric.* | |
| 507 | **Triphyline** * | $(\dot{F}e, \dot{M}n, \dot{L}i)^3 \ddot{P}$ | 3 |
| 508. | **Triplite** | $(\dot{M}n, \dot{F}e)^4 \ddot{P}$ | 3 |
| 509. | **Fischerite** | $\ddot{A}l^2 \ddot{P} + 8\dot{H}$ | 3 |
| | | *Appendix.* | |
| 510. | **Hopeite** | $\dot{Z}n, \ddot{P}, Aq$ | 3 |
| 511. | **Amblygonite** * | $(2(\dot{L}i, \dot{N}a)^3 \ddot{P} + 2\ddot{A}l \ddot{P}) + (Al^2 F^3 + \ddot{A}l)$ | 3 |
| 512. | **Herderite** | $\ddot{A}l, \dot{C}a, \ddot{P}, F$ | 3 |
| 513. | **Carminite** | $\dot{P}b^3 \ddot{A}s + 5\dot{F}e \ddot{A}s$ | 3? |
| 514. | **Romeine** | $\dot{C}a^3, \ddot{S}b, \ddot{S}b$ | 2 |
| | | *b.* Hydrous. | |
| 515. | **Thrombolite** | $\dot{C}u^3 \ddot{P}^2 + 6\dot{H}$ ? | |
| 516. | **Stercorite** | $(\dot{N}a, \dot{N}H^4) \ddot{P} + 9\dot{H}$ | |
| 517. | **Struvite** | $\dot{N}H^4 \dot{M}g^2 \ddot{P} + 12\dot{H}$ | |
| 518. | **Haidingerite** | $\dot{C}a^2 \ddot{A}s + 4\dot{H}$ | 3 |
| 519. | **Pharmacolite** | $\dot{C}a^2 \ddot{A}s + 6\dot{H}$ | 4 |
| 520. | **Vivianite** * | $\dot{F}e^3 \ddot{P} + 8\dot{H}$ | 4 |
| 521. | **Erythrine** * | $\dot{C}o^3 \ddot{A}s + 8\dot{H}$ | 4 |
| 522. | **Hörnesite** | $\dot{M}g^3 \ddot{A}s + 8\dot{H}$ | 4 |
| 523. | **Roesslerite** | $\dot{M}g^2 \ddot{A}s + 15\dot{H}$ | |
| 524. | **Annabergite** * | $\dot{N}i^3 \ddot{A}s + 8H$ | |
| 525. | **Köttigite** | $(\dot{Z}n, \dot{C}o, \dot{N}i)^3 \ddot{A}s + 8\dot{H}$ | 4 |
| 526. | **Symplesite** | $3\dot{F}e \ddot{A}s^2 + 8\dot{H}$ | 4 |
| 527. | **Trichalcite** | $\dot{C}u^3 \ddot{A}s + 5\dot{H}$ | |
| 528. | **Scorodite** * | $\dot{F}e \ddot{A}s + 4\dot{H}$ | 3 |
| 529. | **Libethenite** | $\dot{C}u^4 \ddot{P} + \dot{H}$ | 3 |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 530. | **Olivenite** | $\dot{C}u^4\,(\ddot{A}s, \ddot{P}) + \dot{H}$ | 3 |
| 531. | **Conichalcite** | $(\dot{C}u, \dot{C}a)^4\,(\ddot{P}, \ddot{A}s) + 1\frac{1}{2}\dot{H}$ | |
| 532. | **Euchroite** | $\dot{C}u^4\,\ddot{A}s + 7\dot{H}$ | 3 |
| 533. | **Arseniosiderite** | $\dot{C}a^6\,\ddot{A}s + 4\ddot{F}e^2\,\ddot{A}s + 15\dot{H}$ | 1 |
| 534. | **Pharmacosiderite** | $\ddot{F}e^4\,\ddot{A}s^3 + 18\dot{H}$ | 1 |
| 535. | **Wavellite** * | $\ddot{A}l^3\,\ddot{P}^2 + 12\dot{H}$ | 3 |
| 536. | **Cacoxene** * | $\ddot{F}e^2\ddot{P} + 12\dot{H}$ | |
| 537. | **Childrenite** * | $((\dot{M}g, \dot{F}e, \dot{M}n)^3, \ddot{A}l)^5\,\ddot{P}^3 + 15\dot{H}$ | 3 |
| 538. | **Erinite** | $\dot{C}u^5\,\ddot{A}s + 2\dot{H}$ | |
| 539. | **Cornwallite** | $\dot{C}u^5\,\ddot{A}s + 5\dot{H}$ | |
| 540. | **Phosphochalcite** * | $\dot{C}u^5\,\ddot{P} + 2\frac{1}{2}\dot{H}$ | 3 |
| 541. | **Tagilite** | $\dot{C}u^4\,\ddot{P} + 3\dot{H}$ | |
| 542. | **Tyrolite** | $Cu^5\,\ddot{A}s + 10\dot{H} + \dot{C}a\,\ddot{C}$ ? | 3 |
| 543. | **Delvauxene** | $\ddot{F}e^2\,\ddot{P} + 24\dot{H}$ | |
| 544. | **Dufrenite** * | $\ddot{F}e^2\,\ddot{P} + 2\frac{1}{2}\dot{H}$ | 3 |
| 545. | **Aphanesite** | $\dot{C}u^6\,\ddot{A}s + 3\dot{H}$ | 4 |
| 546. | **Chalcophyllite** | $\dot{C}u^6\,\ddot{A}s + 12\dot{H}$ | 6 |
| 547. | **Liroconite** | $5\dot{C}u^5\,\ddot{A}s + \ddot{A}l^3\,\ddot{P} + 75\dot{H}$ | 4 |
| 548. | **Uranite** * | $(\dot{C}a, \ddot{U}^2)\,\ddot{P} + 12\dot{H}$ | 3 |
| 549. | **Chalcolite** | $(Cu, \ddot{U}^2)\,\ddot{P} + 8\dot{H}$ | 2 |
| 550. | **Carphosiderite** | $\ddot{F}e, \ddot{P}, \dot{H}$ | |
| 551. | **Plumbo Resinite** | $\dot{P}b^3\,\ddot{P} + 6\ddot{A}l\,\dot{H}$ | |
| 552. | **Calcoferrite** | $6(\dot{C}a, \dot{M}g), 3(\ddot{A}l, \ddot{F}e), 4\ddot{P}, 20\dot{H}$ | |

*Sulphato-Phosphates.*

| | | | |
|---|---|---|---|
| 553. | **Pitticite** *Haus* * | $\ddot{F}e^2\,\ddot{S}^3 + 2\ddot{F}e\,\ddot{A}s + 24\dot{H}$ | |
| 554. | **Diadochite** | $\ddot{F}e^3\,\ddot{P}^2 + 2\ddot{F}e\,\ddot{S}^2 + 36\dot{H}$ | |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| | | *Appendix.* | |
| 555. | **Lindackerite?** | $2\dot{C}u^3\,\ddot{A}s + \dot{N}i^3\,\ddot{S} + 8\dot{H}$ | 3 |
| | | *c.* NITRATES. | |
| 556. | **Nitrammite *** | $\dot{N}H^4\,\ddot{N}$ | |
| 557. | **Nitre *** | $\dot{K}\,\ddot{N}$ | 3 |
| 558. | **Nitratine** | $\dot{N}a\,\ddot{N}$ | 6 |
| 559. | **Nitrocalcite *** | $\dot{C}a\,\ddot{N} + \dot{H}$ | |
| | | 6. Carbonates. | |
| | | 1. *Anhydrous Carbonates.* | |
| 560. | **Calcite *** | $\dot{C}a\,\ddot{C}$ | 6 |
| 561. | **Magnesite *** | $\dot{M}g\,\ddot{C}$ | |
| 562. | **Dolomite *** | $(\dot{C}a, \dot{M}g)\,\ddot{C}$ | 6 |
| 563. | **Breunnerite** | $(\dot{M}g, \dot{F}e, \dot{M}n)\,\ddot{C}$ | |
| 564. | **Chalybite *** | $\dot{F}e\,\ddot{C}$ | 6 |
| 565. | **Diallogite *** | $\dot{M}n\,\ddot{C}$ | 6 |
| 566. | **Smithsonite *** | $\dot{Z}n\,\ddot{C}$ | 6 |
| 567. | **Aragonite *** | $\dot{C}a\,\ddot{C}$ | 3 |
| 568. | **Witherite** | $\dot{B}a\,\ddot{C}$ | 3 |
| 569. | **Strontianite *** | $\dot{S}r\,\ddot{C}$ | 3 |
| 570. | **Bromlite** | $\dot{B}a\,\ddot{C} + \dot{C}a\,\ddot{C}$ | 3 |
| 571. | **Manganocalcite** | $\dot{M}n\,\ddot{C}, \dot{F}e\,\ddot{C}, \dot{C}a\,\ddot{C}, \dot{M}g\,\ddot{C}$ | 3? |
| 572. | **Cerusite *** | $\dot{P}b\,\ddot{C}$ | 3 |
| 573. | **Barytocalcite** | $\dot{B}a\,\ddot{C} + \dot{C}a\,\ddot{C}$ | 4 |
| | | 2. *Hydrous Carbonates.* | |
| 574. | **Bicarbonate of Ammonia** | $\dot{N}H^4\,\ddot{C}^2 + \dot{H}$ | |
| 575. | **Trona *** | $\dot{N}a^2\,\ddot{C}^3 + 4\dot{H}$ | 4 |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 576. | **Thermonatrite** | $\dot{N}a\,\ddot{C} + \dot{H}$ | 3 |
| 577. | **Natron** * | $\dot{N}a\,\ddot{C} + 10\dot{H}$ | 4 |
| 578. | **Gay-Lussite** | $\dot{N}a\,\ddot{C} + \dot{C}a\,\ddot{C} + 5\dot{H}$ | 4 |
| 579. | **Lanthanite** * | $\dot{L}a\,\ddot{C} + 3\dot{H}$ | 3 |
| 580. | **Hydromagnesite** * | $\dot{M}g^4\,\ddot{C}^3 + 4\dot{H}$ | 4 |
| 581. | **Hydrocalcite** | $\dot{C}a\,\ddot{C} + 5\dot{H}$ | 6 |
| 582. | **Malachite** * | $\dot{C}u^2\,\ddot{C} + \dot{H}$ | 4 |
| 583. | **Azurite** * | $2\dot{C}u\,\ddot{C} + \dot{C}u\,\dot{H}$ | 4 |
| 584. | **Aurichalcite** * | $2(\dot{Z}n, \dot{C}u)\,\ddot{C} + 3(\dot{Z}n, \dot{C}u)\,\dot{H}$ | |
| 585. | **Zinc Bloom** * | $\dot{Z}n^3\,\ddot{C} + 3\dot{H}$ | |
| 586. | **Emerald Nickel** * | $\dot{N}i^3\,\ddot{C} + 6\dot{H}$ | |
| 587. | **Remingtonite** † | $\dot{C}o\,\ddot{C} + Aq$ ? | |
| 588. | **Zippeite** * | $\ddot{U}^3\ddot{S}^2 + 12\dot{H}$ and $\ddot{U}^3\ddot{S}^2 + \dot{C}u\,\ddot{S} + 12\dot{H}$ | |
| 589. | **Liebigite** | $\ddot{U}\,\ddot{C} + \dot{C}a\,\ddot{C} + 20\dot{H}$ | |
| 590. | **Voglite** | $2\dot{U}\,\ddot{C} + \dot{C}a\,\ddot{C} + \dot{C}u^3\,\ddot{C}^2 + 14\dot{H}$ | |
| 591. | **Bismutite** * | $\ddot{B}i^4\,\ddot{C}^3\,\dot{H}^4$ | |

3. *Carbonates with a Chloride or Fluoride.*

| | | | |
|---|---|---|---|
| 592. | **Parisite** | $8(\dot{C}e,\dot{L}a,\dot{D})\ddot{C} + 2CaF + (\dot{C}e,\dot{L}a,\dot{D})\dot{H}^2$ | 6 |
| 593. | **Kischtimite** | $3\dot{L}a\,\ddot{C} + Ce^2\,(Fl, O)^3 + \dot{H}$ | |
| 594. | **Cerasine** | $Pb\,Cl + \dot{P}b\,\ddot{C}$ | 2 |

## 7. Oxalates.

| | | | |
|---|---|---|---|
| 595. | **Whewellite** | $\dot{C}a\,\ddot{\ddot{C}} + \dot{H}$ | 4 |
| 596. | **Oxalite** | $2\dot{F}e\,\ddot{\ddot{C}} + 3\dot{H}$ | |
| 597. | **Thierschite** | $\dot{C}a, \ddot{\ddot{C}}$ | |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|

## E. RESINS AND ORGANIC COMPOUNDS.

| | | | |
|---|---|---|---|
| 598. | **Amber** * | $C^{10} H^{8} O$ | |
| 599. | **Copaline** | $C^{40} H^{32} O$ | |
| 600. | **Middletonite** | $C^{20} H^{10} + \dot{H}$ | |
| 601. | **Retinite** * | | |
| 602. | **Scleretinite** | $C^{10} H^{7} O$ | |
| 603. | **Guyaquillite** | $C^{20} H^{13} O^{3}$ | |
| 604. | **Piauzite** | | |
| 605. | **Walchowite** | $C^{12} H^{9} O$ | |
| 606. | **Bitumen** * | $C^{6} H^{5}$ | |
| 607. | **Idrialine** | $C^{42} H^{14} O$ | |
| 608. | **Pyropissite** | | |
| 609. | **Brewstoline** | $\ddot{C}$ ? | |
| 610. | **Elaterite** * | C, H | |
| 611. | **Scheererite** | $C H^{2}$ ? | 4 |
| 612. | **Könlite** | $C^{2} H$ | |
| 613. | **Fichtelite** | $C^{4} H^{3}$ | 4 |
| 614. | **Könleinite** | $C^{38} H^{18}$ | |
| 615. | **Hartite** | $C^{6} H^{5}$ | 4 |
| 616. | **Hartine** | $C^{20} H^{17} O^{2}$ | 3 |
| 617. | **Ixolyte** | | |
| 618. | **Hatchettine** | C, H | |
| 619. | **Ozocerite** | C, H | |
| 620. | **Chrismatine** | | |
| 621. | **Dopplerite.** | $C^{3} H^{5} O^{5}$ | |

| No. | Name. | Formula. | System of crystallization. |
|---|---|---|---|
| 622. | **Dinite** | | |
| 623. | **Hircine** | | |
| 624. | **Jaulingite** | | |
| 625. | **Melanchyme** | | |
| 626. | **Anthracoxene** | | |
| 627. | **Baikerite** | | |
| 628. | **Krantzite** | | |
| 629. | **Mellite** | $\ddot{A}l\,\bar{M}^3 + 18\dot{H}$ | 2 |

# CHECK LIST OF MINERALS.

1. Gold *
2. Platinum *
3. Platiniridium *
4. Palladium
5. Quicksilver
6. Amalgam
7. Arquerite
8. Gold Amalgam *
9. Silver *
10. Bismuth Silver
11. Copper *
12. Lead
13. Iron
14. Tin
15. Zinc
16. Iridosmine *
17. Tellurium
18. Bismuth *
19. Tetradymite *
20. Antimony
21. Arsenic *
22. Arsenical Anti-
23. Sulphur * [mony *
24. Selenium
25. Selensulphur
26. Diamond *
27. Mineral Coal
    27a. Anthracite *
    27b. Bituminous
    27c. Jet * [Coal *
    27d. Lignite *
28. Graphite *
29. Realgar
30. Orpiment *
31. Dimorphine
32. Bismuthine *
33. Stibnite *
34. Discrasite
35. Domeykite *
36. Algodonite *
37. Whitneyite *
38. Silver Glance *
39. Erubescite *
40. Galena *
41. Steinmannite
42. Cuproplumbite ?
43. Alisonite
44. Manganblende
45. Syepoorite
46. Eisennickelkies
47. Clausthalite
48. Naumannite
49. Berzelianite
50. Eucairite
51. Hessite *
52. Altaite
53. Grünauite
54. Blende *
55. Copper Glance *
56. Akanthite
57. Stromeyerite
58. Cinnabar *
59. Millerite *
60. Pyrrhotine *
61. Greenockite
62. Wurtzite
63. Onofrite
64. Copper Nickel *
65. Breithauptite *
66. Kaneite
67. Schreibersite
68. Pyrites *
69. Hauerite
70. Smaltine *
71. Cobaltine
72. Gersdorffite *
73. Ullmannite
74. Marcasite *
75. Rammelsbergite
76. Leucopyrite *
77. Mispickel *
78. Glaucodot
79. Sylvanite *
80. Nagyagite
81. Covelline
82. Molybdenite *
83. Riolite
84. Skutterudite
85. Linnæite *
86. Cuban
87. Chalcopyrite *
88. Barnhardite *
89. Tin Pyrites
90. Sternbergite
91. Wolfsbergite
92. Tannenite
93. Berthierite
94. Zinkenite
95. Miargyrite

96. Plagionite
97. Jamesonite
98. Heteromorphite
99. Brongniardite
100. Chiviatite
101. Dufrenoysite
102. Pyrargyrite
103. Proustite *
104. Freieslebenite *
105. Bournonite
106. Kenngottite
107. Boulangerite
108. Aikinite
109. Wölchite
110. Clayite?
111. Kobellite?
112. Meneghinite
113. Tetrahedrite *
114. Tennantite *
115. Geocronite *
116. Polybasite
117. Stephanite
118. Enargite *
119. Xanthocone
120. Fireblende
121. Wittichite
122. Calomel
123. Sylvine
124. Salt *
125. Sal Ammoniac
126. Kerargyrite
127. Embolite
128. Bromyrite
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