

## 111.5 - Rock and Minerals (powder form)

PLEASE NOTE: The tables are presented to facilitate comparisons among a family of materials to help customers select the best SRM for their needs. For specific values and uncertainties, the certificate is the only official source.

| Description >>  | <a href="#">1d</a><br>Limestone, Argillaceous | <a href="#">70b</a><br>Potassium Feldspar | <a href="#">81a</a><br>Glass Sand | <a href="#">88b</a><br>Dolomitic Limestone | <a href="#">99b</a><br>Soda Feldspar | <a href="#">165a</a><br>Glass Sand | <a href="#">278</a><br>Obsidian Rock | <a href="#">688</a><br>Basalt Rock | <a href="#">1413</a><br>High Alumina Sand | <a href="#">2429</a><br>Flue Gas Desulfurization Gypsum | <a href="#">2780a</a><br>Hard Rock Mine Waste |
|---|---|---|-----------------------------------|--|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|---|---|---|
| Unit of Issue >>  | 70 g  | 1 bottle x 40g                            | 75 g                              | 75 g                                       | 40 g                                 | 75 g                               | 35 g                                 | 60 g                               | 75 g                                      | 1 bottle x 200 g  | 50 g  |
| (Concentrations are in mass fractions, in %, unless noted by an asterisk for mg/kg) |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   |   |
| <sup>26</sup> Al  |   | 7.98                                      |                                   |  | 10.36                                |                                    |                                      |                                    |   |   | 8.43  |
| Aluminum  |   |   |                                   |  |                                      | 0.059                              | 14.15                                | 17.36                              | 9.90                                      |   |   |
| Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> )                                    | 0.526   |   | 0.66                              | 0.336                                      |                                      |                                    |                                      |                                    |   |   |   |
| Antimony  |   |   |                                   |  |                                      |                                    |                                      |                                    |   | 18.3*   |   |
| Arsenic   |   |   |                                   |  |                                      |                                    |                                      |                                    |   | 2.53*   | 65.9*   |
| Barium  |   | 28.2*                                     |                                   |  | 1409*                                |                                    |                                      |                                    |   | 49.6*   | 0.093   |
| Barium oxide  | 0.0033  |   |                                   |  |                                      |                                    | (1140*)                              |                                    | 0.12                                      |   |   |
| Beryllium   | (0.1)*  |   |                                   |  | (2.8*)                               |                                    |                                      |                                    |   |   | 1.1*  |
| Bismuth   |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 45*   |
| Boron   |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | (27*)   |
| Cadmium   | (0.3)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 4.8*  |
| Calcium   |   | 0.1770                                    |                                   |  | 1.18*                                |                                    |                                      |                                    |   |   | 0.247   |
| Calcium oxide   | 52.85   |   |                                   | 29.95                                      |                                      |                                    | 0.983                                | (12.17)                            | 0.74                                      | 31.93   |   |
| Carbon  | 11.50   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 0.19  |
| Cerium  | (4)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 67.7*   |
| Cesium  | (0.4)*  |   |                                   |  | (2.5*)                               |                                    |                                      |                                    |   |   | 8.3*  |
| Chlorine  | (130)*  |   |                                   |  |                                      |                                    |                                      |                                    |   | (23.5*)   |   |
| Chromium  |   | (0.7*)                                    |                                   |  |                                      |                                    |                                      |                                    |   | 2.74*   | 205*  |
| Chromium Trioxide (Cr <sub>2</sub> O <sub>3</sub> )                                 | 0.0012  |   | 46*                               |  |                                      | (1*)                               | (6.1*)                               | 332*                               |   |   |   |
| Cobalt  |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 16.5*   |
| Copper  |   |   |                                   |  |                                      |                                    | 5.9*                                 |                                    |   |   | 240*  |
| Dysprosium  | (0.6)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 3.1*  |
| Erbium  | (0.4)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 2.0*  |
| Europium  | (0.1)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 0.9*  |
| FeO**   |   |   |                                   |  |                                      |                                    | 1.36                                 | 7.64                               |   |   |   |
| Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> **)                                    | 0.3191  |   | 0.082                             | 0.277                                      |                                      | 0.012                              | 2.04                                 | 10.35                              | 0.24                                      |   |   |
| Fluorine  | (160)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   |   |
| Gadolinium  | (0.5)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 3.2*  |
| Gallium   | (3)*  |   |                                   |  | (15*)                                |                                    |                                      |                                    |   |   | 21*   |
| Germanium   |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | <6*   |
| Gold  |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 6.6*  |
| Hafnium   |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 5.5*  |
| Holmium   | (0.1)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 0.7*  |
| Iridium   |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 1.65*   |
| Iron  |   | 0.13                                      |                                   |  | 278.7*                               |                                    |                                      |                                    |   |   | 8.75  |
| Iron oxide  |   |   |                                   |  |                                      |                                    |                                      |                                    |   | 0.2357  |   |
| Lanthanum   | (4)*  |   |                                   |  | (1.9*)                               |                                    |                                      |                                    |   |   | 34.4*   |
| Lead  |   | 57*                                       |                                   |  | 71.2*                                |                                    | 16.4*                                |                                    |   | 0.763*  | 0.665   |
| Lithium   |   |   |                                   |  | (7.9*)                               |                                    |                                      |                                    |   |   | 14*   |
| Loss on Ignition  | 41.57   | <0.5                                      |                                   | (46.98)                                    |                                      |                                    |                                      |                                    |   |   | 11.1  |
| Lutetium  |   |   |                                   |  |                                      |                                    |                                      |                                    |   | (12.1*)   | 0.33*   |
| Magnesium   |   | 298*                                      |                                   |  |                                      |                                    |                                      |                                    |   |   | 0.465   |
| Magnesium oxide   | 0.301   |   |                                   | 21.03                                      |                                      |                                    | (0.23)                               | (8.4)                              | 0.06                                      | 0.0431  |   |
| Manganese   | 0.0209  | 63*                                       |                                   | 0.0160                                     | 17.47*                               |                                    | 0.052                                | 0.167                              |   |   | 490*  |
| Mercury   |   |   |                                   |  |                                      |                                    |                                      |                                    |   | 0.778*  | (0.2*)  |
| Molybdenum  |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 25.0*   |
| Neodymium   | (3)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 28.3*   |
| Nickel  | (4)*  |   |                                   |  |                                      |                                    | 3.6*                                 |                                    |   |   | 95*   |
| Niobium   | (0.7)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 20*   |
| Phosphorus  |   | 790*                                      |                                   |  | 44*                                  |                                    |                                      |                                    |   |   | 286*  |
| Phosphorus Oxide (P <sub>2</sub> O <sub>5</sub> )                                   | 0.0413  |   |                                   | 0.0044                                     |                                      |                                    | 0.036                                | 0.134                              |   | 0.01560   |   |
| Potassium   |   | 6.33                                      |                                   |  | 3.09                                 |                                    |                                      |                                    |   | (9.6*)  | 3.99  |
| Potassium Oxide (K <sub>2</sub> O)  | 0.1358  |   |                                   | 0.1030                                     |                                      |                                    | 4.16                                 | 0.187                              | 3.94                                      | 0.04587   |   |
| Praseodymium  | (0.6)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 8*  |
| Rhenium   |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | (0.003*)                                      |
| Rubidium  |   | 495*                                      |                                   |  | 72.6*                                |                                    |                                      |                                    |   |   | 220*  |
| Rubidium Oxide (Rb <sub>2</sub> O)  | (Rb 6)*                                       |   |                                   |  |                                      |                                    | 127.5*                               | 1.91*                              |   |   |   |
| Samarium  | (0.5)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 4.7*  |
| Scandium  |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 15.6*   |
| Selenium  |   |   |                                   |  |                                      |                                    |                                      |                                    |   | 5.27*   | (6*)  |
| Silicon   |   | 34.4                                      |                                   |  | 32.07                                |                                    |                                      |                                    |   |   | 24.1  |
| Silicon Dioxide (SiO <sub>2</sub> )   | 4.080   |   |                                   | 1.13                                       |                                      |                                    | 73.05                                | 48.4                               | 82.77                                     | 0.810   |   |
| Silver  |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 72.5*   |
| Sodium  |   | 2.36                                      |                                   |  | 5.25                                 |                                    |                                      |                                    |   | (11.6*)   | 0.108   |
| Sodium Oxide (Na <sub>2</sub> O)  | 0.0109  |   |                                   | 0.0290                                     |                                      |                                    | 4.84                                 | 2.15                               | 1.75                                      |   |   |
| Strontium   |   | 27*                                       |                                   |  | 444*                                 |                                    |                                      |                                    |   | 328.9*  | 121*  |
| Strontium oxide   | 0.0303  |   |                                   | 0.0076                                     |                                      |                                    | 63.5*                                | 169.2*                             |   |   |   |
| Sulfur  | 0.1028  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 8.85  |
| Tantalum  |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 1.2*  |
| Tellurium   |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 22*   |
| Terbium   | (0.09)*                                       |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 0.5*  |
| Thallium  |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 5.5*  |
| Thorium   | (0.5)*  |   |                                   |  |                                      |                                    | 12.4*                                |                                    |   |   | 12.0*   |
| Thulium   |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 0.21*   |
| Tin   | (1)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 2.2*  |
| Titanium  |   | 32*                                       |                                   |  |                                      |                                    | 0.54*                                |                                    |   |   | 0.643   |
| Titanium Dioxide (TiO <sub>2</sub> )  | 0.0306  |   | 0.12                              | (0.016)                                    |                                      | 0.011                              | 0.245                                | 1.17                               | 0.11                                      | 0.020   |   |
| Tungsten  |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 17.4*   |
| Uranium   | (1)*  |   |                                   |  |                                      |                                    | 4.58*                                |                                    |   |   | 4.0*  |
| Vanadium  | (10)*   | 0.93*                                     |                                   |  |                                      |                                    |                                      |                                    |   |   | 152*  |
| Ytterbium   | (0.3)*  |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 2*  |
| Yttrium   | (5)*  |   |                                   |  | (1.6*)                               |                                    |                                      |                                    |   |   | 18*   |
| Zinc  |   | 7.7*                                      |                                   |  | (2.6*)                               |                                    |                                      |                                    |   |   | 0.102   |
| Zinc oxide  | 0.0022  |   |                                   |  |                                      |                                    |                                      |                                    |   |   |   |
| Zirconium   |   |   |                                   |  |                                      |                                    |                                      |                                    |   |   | 206*  |
| Zirconium dioxide   |   |   | 0.034                             |  |                                      | 0.006                              |                                      |                                    |   |   |   |

- Certified values are normal font.  
 - Non-certified and referend values are italicized.  
 - Information values and values of potential interest are within parentheses.