

## **Supplementary Read-Me File: Instructions for Supplementary Table 5**

### **An evolutionary system of mineralogy, Part VIII: The evolution of the metamorphic minerals**

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Supplementary Table 5 is a csv file that records percentages of coexistence of pairs of 94 of the most commonly encountered metamorphic minerals. This file is thus a 94 x 94 half-matrix that is calculated from data in Supplementary Table 4.

Column A and Row 1 indicate the names of mineral kinds listed in alphabetical order.

Each element in this matrix is a percent from 0 to 100 that indicates percentage of the less common mineral that coexists with the more common mineral. Consider matrix element D2, which relates to the coexistence of *actinolite* (with 74 occurrences, as listed in Supplementary Table 4) and *albite* (with 177 occurrences). In Supplementary Table 4, matrix element D2 reveals that 20 rocks (out of 2785 tabulated) contain both *actinolite* and *albite*. Therefore, in Supplementary Table 5, matrix element D2 =  $20/74 \times 100 = 27$  percent.

This protocol is especially important when considering the coexistence of a relatively rare mineral with a common one. For example, *baddeleyite* is a relatively scarce metamorphic mineral, occurring in only 18 of 2785 metamorphic rocks recorded in Supplementary Table 3. However, 16 of those occurrences also contain *calcite*. Therefore, as recorded in matrix element Q14 of Supplementary Table 5,  $16/18 = 89\%$  of *aegirine* occurrences also have *calcite*.

Note that each of the 94 diagonal elements of this matrix is 100 % (i.e., each mineral always coexists with itself).

An important feature of this matrix is that of the 4371 off-diagonal matrix elements [i.e.,  $(94^2 - 94)/2$ ], 40.0 % are non-zero, indicating that the corresponding pair of minerals coexists in at least one reported rock in Supplementary Table 3. However, only 8.8 % of possible mineral pairs coexist in 25 % or more of the rocks studied.