Supplementary Read-Me File: Instructions for Supplementary Table 5

An evolutionary system of mineralogy, Part VII: The evolution of the igneous minerals (> 2500 Ma)

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Supplementary Table 5 is an xlsx file that records percentages of coexistence of pairs of the 115 most commonly encountered primary igneous minerals. This file is thus a 115 x 115 half-matrix that is calculated from data in Supplementary Table 4.

Column A and *Row 1* indicate the mineral names, with the 51 most common major phases (defined as > 5 volume percent) listed first in alphabetical order, followed by 64 common accessory phases (< 5 volume percent).

Each element in this matrix is a precent from 0 to 100 that indicates percentage of the less common mineral that coexists with the more common mineral. Consider matrix element C2, which relates to the coexistence of aegirine (with 521 occurrences, as listed in Supplementary Table 5) and albite (with 543 occurrences). In Supplementary Table 4, matrix element C2 reveals that 161 rocks (out of 1850 tabulated) contain both *aegirine* and *albite.* Therefore, in Supplementary Table 6, matrix element C2 = 161/521 x 100 = 31 percent.

This protocol is especially important when considering the coexistence of a relatively rare mineral with a common one. For example, *aenigmatite* is a relatively scarce accessory mineral, occurring in only 53 of 1850 igneous rocks recorded in Supplementary Table 3. However, 46 of those occurrences also contain *aegirine*. Therefore, as recorded in matrix element BB2 of Supplementary Table 6, 87 % of *aenigmatite* occurrences also have *aegirine*.

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

An important feature of this matrix is that of the 6555 off-diagonal matrix elements [i.e., $(115^2 - 115)/2$], 52 % are non-zero, indicating that the corresponding pair of minerals coexists in at least one reported rock in Supplementary Table 3. However, only 22 % of possible mineral pairs coexist in 25 % or more of the rocks studied.