

CLASSIFICATION OF IGNEOUS ROCKS METHODOLOGY

Methodology to follow for classifying igneous rocks given a table of whole rock geochemical data, mineral percentages and some information about the grainsize.

STEP 1

Can the rock be classified on the QAPF diagrams? Remember that the QAPF diagrams are for rocks where the M-component is less than 90%. Therefore to answer this question you need to add up the percentages of all minerals that do not constitute the QAPF components and see if they sum to more than 90%. If they do then this means the rock is an ultramafic rock and go to STEP 2. If not then go on to STEP 2.

STEP 2

Classify any rocks that have M greater than 90% on one of the ultramafic classification diagrams. Remember to normalise the three components of the appropriate ternary diagram to 100%. Use the modal mineralogy to decide which is the appropriate diagram

STEP 3

Which rocks are volcanic and which are plutonic? This is based mostly on grainsize of the matrix. If you have this information, then the fine-grained rocks will be volcanic and the coarse-grained rocks will be plutonic. Remember that a fine-grained volcanic rock can have large phenocrysts in it.

STEP 4

Classify the fine-grained rocks on the TAS diagram for volcanic rocks using the wt% Na₂O, K₂O and SiO₂ values from the given table. If the rock contains a foid mineral you may want to check where it plots on the volcanic QAPF to make sure your rock name is as specific as possible

STEP 5

Classify the coarse-grained rocks on the QAPF diagram. Remember to normalise the QAPF components to 100%, keeping in mind that if you have some F component you should not have a Q component.

STEP 6

If some of your rocks plot near the P apex of the QAPF, then these rocks are gabbroic rocks and you should further classify them according to the ternary gabbro classification diagrams

STEP 7

To classify the rocks on the gabbroic classification diagrams remember to renormalise the three components of the appropriate ternary diagram to 100%. Use the modal mineralogy to decide which is the appropriate diagram.