
geological and radio metric investigations on some minerals in sinai

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Umm Alaw1 area, covering 500 km~ occupies an impor~an~por~10n or t.nebasemen~ rocks ot':>ou~hsmal . During t.het'lelds~udy, ~he rock uni~s ot'~his area could be subdivided t nt,oseven prominem~ divis10ns; V1Z, me~agabbro and gneissosediori~e, quar~z diori~e-granodior1~e- adamell1~e associa~ion,quar~z monzoni~e, pegma~1~lc grani~e (~hese rocks represen~he pre-r1ng dyke), Ru~ig volcan1cs, r1ng dykes (rhyodac1~e,porphyri~lc quar~z syeni~e w1~h syen1~e and medium grainedquar~z syeni~e) and alkall t"eldspar grani~e (~hese rocksrepresen~ ~he r1ng-dyke).The me~agabbro and gneissose diori~e are ~he oldes~rock uni~s; ~hey are coarse grained, grey ~o black in colourand form low h111s 1n ~he landscape They exhibi~ bo~hgrada~ional con~ac~ rela~ion and sharp, t'aul~ -con~ac~s wi~h~he surrounding rocks.As regards~o ~he quar~z dior1~e granodior1~e-adamelli~eassocia~10n, ~he quar~z dior1~e is grey, medium ~o coarsegrained, speckled w1~h black amphi~ole crys~als wh1ch usuallyshow pret'erredorien~a~10n grading la~erally t.o a pronouncedt"o11a~10n.Con~ac~s be~ween quar~z dior1~e and surroundingrocks are sharp, grada~10nal and some~1mes t"aul~con~ac~s. Thegranodior1~e and adamell1~e have very coarse and mediumgrained ~ex~ures; and are reddish whi~e ~o wh1~1sh grey incolours. They t'orm low h111s closely assocla~ed wi~h ~heme~agabbro, quar~z dior1~e and quar~z monzoni~e. The ou~cropsor ~hese rocks exnrbat- marked ext'01ia~10nwea~hering wi~h welldesveloped boundr1ng.- 87 -QuarLZ monzoniLe 1S medium LO coarse grained, grey LOreddish grey 1n colour and rorm low, h1ghly weaLhered hillsW1Lh some alLered zones. ConLacLs WiLh Lhe surrounding rocksmosLly exh1b1L sharp relaL10ns and are rrequenLly delinealedby tau l LS.The pegmaLiLlc graniLe is very coarse grained,leucocraLic and rorm low, highly weaLhered h111s WhLchcommonly dissecLed by dyke swarm; specially 1n Lhe norLh andnorLheasLern parLs or Lhe sLudy area.The RULig volcan.1cs represenL the base or GebelKather1na. They are medium LO r.lnegra.lned, grey LO reddishgrey and black, acid Lo lnLermediaLe and assciaLed wiLhpyroclasL.lc sedimenLs. They show angular and subhorizontalcontacLs W1Lh the granlLO.ld rocks.The ring dykes are composed or rhyodac1Le, porphyrlL.lcand m.lcrographic quarLz syeniLe and syeniLe. They invade Lheabove menLioned rocks 1n Lhe sLudy area and have a greyishblack, red and wh.lLish red colours. The conLacL beLween Lher-a rig dykes and surrounding rocks are moest.Lytau Lt, cont.ac t..The alkali reldspar graniLe is

medium LO coarse grained and vary in colour from pink, buff to pinkish yellow. The boundary with the other rocks is always sharp. This rock unit intrudes all the above mentioned rock units and perhaps the younger granites or the late Orogenic granites or the East African Desert. It is the granitic rocks all around, therefore, the use of the some sort of the major and some trace elements will be geochemically meaningful, for the interpretation of the data. The Y , Nb and Th as well as some other trace elements have indicated that the studied rocks fall mainly in the field of the high alkali granite and partly in the volcanic arc granite. Which are of different tectonic setting. The diversity of tectonic interpretation may be attributed to the fact that in the upper mantle during intrusion. The $\text{Rb}/\text{Y} + \text{Nb}$ diagram, which is used both for the plate and volcanic arc origins favouring mixing during the formation of the present granitic rocks. The Alawi area is highly dissected by a great number of faults, of which 125 true and inferred faults were examined and statistically plotted on rose diagrams. Eight tectonic units were distinguished in the study area E-W, ENE-WSW, NE-SW, NNE-SSW, WNW-ESE, NW-SE, NNW-SSE and N-S in decreasing order of age. The dykes which invade the various rock units in the study area were recorded, statistically analyzed and plotted on a rose diagram. The results of this analysis show that the first phase of volcanic activity which followed the extension of the Rifting volcanics is mostly acidic and alternates with the basic and intermediate dykes (rejuvenated along NE-SW). They have the following trends; NNE-SSW, NE-SW and E-W. The second phase has the following trends NNW-SSE, NW-SE, NE-SW and NW-SE. The third phase (Late Neogene dykes) has only a N-S trend and is represented by basalts and dolerites. Some sandstone outcrops with characteristic of Nubian facies were recorded filling the N-S fractures. The U/Th ratio of the rocks is generally higher than the corresponding means. In addition, the U/Th ratio exceeds 100% in some rocks. These results indicate the presence of more than one tectonic population; a fact which confirms that these were derived from more than one magma. The U/Th ratio was found to be generally higher than the U/Th ratio, which may be attributed to the leaching of the highly mobile U under disequilibrium conditions.