Chemical characteristics some of the granitic bodies from Terengganu area

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The present study involve some of the granitic rocks from the Eastern granitic belt which is located in the Terengganu area (Map 1). Four granitic bodies will be considered : they are Maras Jong pluton, Jerong batholith, Perhentian granite pluton, and Kapal batholith. *The Maras Jong pluton* is the most easterly granitic pluton in the Eastern Belt of mainland Terengganu. The rock is coarse grained and consists of plagioclase, K-feldspar, quartz, biotite, apatite, tourmaline, opaque phases, muscovite, sericite, chlorite and epidote. *The Jerong batholith* located immediately to the south of the Maras Jong pluton. The batholith is a rather small but complex body having a compositional range from gabbro to granite. It consists of several plutons such as Tanggol, Wakaf and Kenanga granites. They consists of plagioclase, K-feldspar, quartz, hornblende, biotite, pyroxene, olivine, apatite, opaque phase and sphene. *The Perhentian granite* is located in the Perhentian island off Terengganu area. They consists of plagioclase, K-feldspar, quartz, hornblende, biotite, allanite, epidote, apatite, opaque phase and sphene. *Kapal batholith* is one of the largest granitic bodies in the Eastern Belt. The batholith consists of several smaller granitic plutons such as Saok granodiorite, Chengal granite and Kesing granite. The batholith is a composite body ranging from diorite to monzogranite in composition and dominated by granodiorite. They consists of plagioclase, K-feldspar, quartz, hornblende, biotite, pyroxene, apatite, opaque phase and sphene.

The range of SiO_2 in each granitic body is: Maras Jong (65.67–76.34%), Jerong (66.7–76.9), Perhentian (70.9–75.4%) and Kapal (63.03–76%). This shows that the range of SiO_2 values from each granitic bodies, especially the Maras Jong, Jerong and Kapal overlap. In general, the plots show clear trends of decreasing Al_2O_3, TiO_2, $Fe_{(tot)}$, MgO, CaO, P_2O_5 and MnO and K_2O increase with increasing SiO_2. Two samples from Kapal batholith show exceptionally high MgO, CaO and low Na_2O. Differences between the four granites probably is best illustrated on a P_2O_5 vs SiO_2 diagram. Thus, two trends can be differentiated in this diagram, Maras Jong samples form a separate trend to those of other three granites. This is a result from a higher P_2O_5 content of the Maras Jong granite compared to the other three granites at a given SiO_2 concentration. For example granites with 65% SiO_2 from the Maras Jong have 0.24% P_2O_5 compared to the rock from Kapal granite which only has 0.16% P_2O_5 at a same SiO_2 contents. This probably indicates that this samples may represent a separate pulse from the rest of the Kapal granite samples. All granites are high K calc alkali. They also have high total alkali content where (Na_2O + K_2O : 5.9 to 9.8) and are mildly metaluminous to peraluminous (ACNK values : Maras Jong = 1.01–1.27; Jerong = 0.98–1.05; Perhentian = 0.92–1.03 and Kapal = 0.89–1.07). Both Ce and La in Kapal and Jerong granites plot in two trends respectively, one decreases and the other increases with SiO_2. This may indicate that these granites consist of several separate granitic pulses. The Kapal granite also shows significantly low Nb compared to the other three granites whereas the Maras Jong granite has low Ce, Y and La. All granites have low Sr and V and high La compared to the rocks from elsewhere (e.g. Cordillera Blanca batholith, Peru). All the granitic rocks evolved towards high Y concentration and low Sr/Y ratios similar to the mantle wedge derived magma.

LIL elements and TiO_2 vs Zr plots of all the granites indicate that K-feldspar, biotite plagioclase, zircon, biotite, hornblende and sphene play an important role in determining the variation during fractionation process. The geochemistry of the granites show that each granitic body has a specific character and probably is made up of individual batches of melt.

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