

# NEPHELINE SYENITIC MAGMA SUPER REHEATING OF THE VITÓRIA ISLAND SYENITIC INTRUSIVE ROCK BODY, SÃO PAULO, BRAZIL

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The Vitória Island Intrusive Rock Body, Cretaceous in age, has semicircular form and concentric compositional structure: alkali syenite with nepheline in the centre, alkali syenite without nepheline and quartz in the border, and alkali syenite with quartz in the margin. The field relation between these rocks is gradual transition. The chemical compositions of these rocks are over the thermal-divide, that is, thermodynamically unstable. Such composition is not rare, but its origin has been scarcely discussed. To generate an unstable magma from a stable one, the magma super reheating is one of the possible hypothesis.

Many clinopyroxene grains of the syenitic rocks of Vitória Island show resorpted form and are surround by hydrated minerals, such as amphibole and biotite. This texture indicates that the clinopyroxene, once crystallised, have reacted with the melt of high  $H_2O$  content. It is commonly observed in Brazil that a syenitic rock body is intruded by later ultramafic rock body. If an ultramafic magma of high temperature is injected in a magma chamber filled by stable nepheline syenitic magma, the latter will be super reheated. In the border zone of the magma chamber, the super reheated magma may melt the country continental crust rock of granitic composition. Due to the temperature higher than normal one, the subsaturated nepheline syenite magma can mix freely with the supersaturated granitic magma in any proportion over the thermal-divide, to make unstable alkaline syenitic magma. The  $H_2O$  included in the country rock will pull suddenly up the  $H_2O$  content of the magma.