MINERAL CHEMISTRY OF ALKALINE ROCKS FROM MONTE DE TRIGO ISLAND, SOUTHEAST COAST OF BRAZIL

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Monte de Trigo island presents an association of miaskitic alkaline rocks from Serra do Mar Cretaceous Alkaline Province, emplaced into Precambrian granite-gneisses. Rocks vary from leucocratic to ultramafic, occurring as plutonic or subvolcanic (dykes and breccias) bodies. Nepheline syenite, nepheline monzosyenite and nepheline-bearing syenite constitute the prevailing lithology (90%), subordinately, a cumulate mafic-ultramafic body (olivine gabbro, theralites, ijolites and clinopyroxenites) occurs. Microsyenites, porphyritic phonolites, alkaline basalts and lamprophyres dykes cut the massif.Mafic-ultramafic rocks contain chrysolite-hyalosiderite, pyroxene (mainly Fe3+ subsilicic diopside), bytownite-andesine, potassian kaersutite, biotite/phlogopite, opaques, apatite and titanite. Fe3+, Ti and [6]Al tschermakitic substitutions prevail in the mafic minerals, mainly in pyroxene, showing common or oscillatory zoning.Syenitic rocks are concentrically zoned, becoming more undersaturaded finer inequigranular varieties towards the center. They include mesoperthitic alkali feldspar, interstitial nepheline, diopside-hedenbergite, hastingsite-ferropargasite, biotite, opaques, titanite and apatite. Mafic minerals show irregular zoning and compositional variations identified by Mg=Fe2+ substitution being more Fe2+ within the body core.Core pyroxene compositions change towards more evolved rocks with Fe2+, (secondly Fe3+, Na and Zr) increase and Mg, Ti and Al decrease.AFC process could be the main differentiating mechanism of this complex. Fractional crystallization is evidenced by the mineral chemistry of nepheline monzosyenite, reflecting both mafic/ultramafic and syenitic composition. The presence of the cumulate body also suggests this process. Less undersaturated felsic and mafic rocks at marginal portions of the complex could indicate country-rocks assimilation.