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Geochemical of Volcanic Rock Powder Sample from Serra Geral Formation:
An Important Remineralizer

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Academic Work

Remineralizar (Stonemeal)

- **Remineralizer**: rock material undergoes only to mechanical process of the reduction and classification to increase the soil fertilizing and improve the physical or physico-chemical properties or biological soil activity.

In 2013, the remineralizer was included on the brazilian's law of fertilizers. Now the working group's been discussing the regulatory standard to allow the remineralizer register.

Objectives and methods

Determination of the rock powder chemical and mineral characteristics.

By: ICP, RXD, RXF, Petrografy microscopy;
and,
Chemical mobility of the elements (fertilizer and toxic elements) in leaching tests. Performed in: Milli-Q water and into five acidic solutions in particle size range < 0.1mm, too solid ratio (L/S) of 10 ml/g for 24 h.

Petrography - Mineralogy

Texture : hipocrystalline texture

Composed : shown by spherulitic aggregates of:
phenocrystals (30-35 %)

± Ca-plagioclase

± K-feldspar (sanidine)

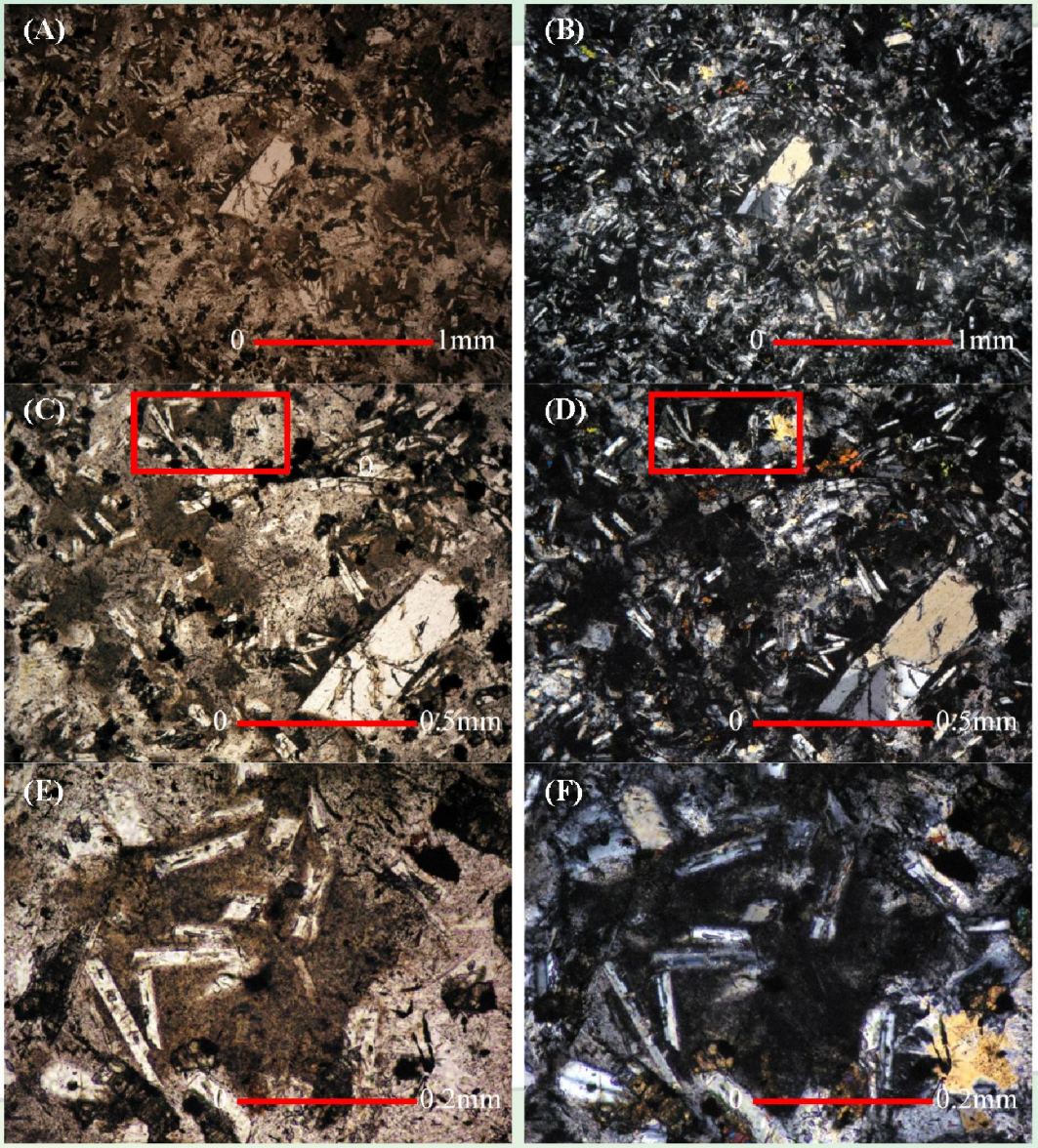
clinopyroxene (augite)

Hipocrystalline vitrophyric matrix (50-60%) with presenting desvetrified sites

± apatite (5%) - source of “P”

± quartz

accessory mineralogy: opaque (Ti-magnetite ± ilmenite)



Phenocrystals of plagioclase in microcrystalline composed of plagioclase and pyroxene in spherulitic forms

Crystallites of plagioclase in association with mafic minerals and incipient micrographic texture - apatite.

Chemical and Mineral Characteristics

Óxido	%
Al_2O_3	13,7
BaO	0,1
CaO	2,7
Fe_2O_3	7,5
K_2O	3,3
MgO	1,2
MnO	0,2
Na_2O	2,7
P_2O_5	0,2
SiO_2	63,8

RXF

60% of amorphous mineral

Mineral	%
Anorthite	54
Quartz	15
Cristobalite	1
Sanidina	19
Augite	10

RXD

Leaching Characteristics

Element	Powder (mg/kg)	Ext. 4 (%)	Ext. 6 (%)
		AC 1% - pH 3	AO 1% - pH 2
Al	43.769	2	9
Ca	16.536	10	16
Na	14.029	2	4
K	16.054	1	3
P	691	35	93
Cu	66	12	52
Zn	116	8	23
Fe	28.398	4	34
Ba	647	4	12
As	3	23	68
V	84	2	16
Pb	19	8	3

Discussion

1. This first study show interesting characteristics, with better effective extraction of the K and P than Al and Fe, but we agree that the methodology with high acid pH not is the better model to determination of the remineralizer's behavior.

2. After the experiments we could see the big formation of the clay mineral with high Fe and Al concentration (because of the red color).

3. On the other hand with exception of the As, the other toxics elements have dissolution little rate, and more, they have trace concentrations.

4. The toxic elements have less extractions than nutrients. We have observed in our new test, not published yet, that the environmental pH extraction shows more extraction of the Si than Al, and Al is not detect in agronomic analyzes.

Thanks

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