

Hematitic phyllites as metamorphic product of Proterozoic surface alteration profiles

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The basal unit (Guinda Group, Late Paleoproterozoic) of the Paleo-/ Mesoproterozoic Espinhaço Supergroup is lithologically characterised by quartzites, subordinated phyllites and metaconglomerates (partially diamond-bearing) and minor occurrences of hematitic phyllites and green-schist of igneous origin. The hematitic phyllites are grey, dense rocks essentially composed by sericite/muscovite and Fe-oxides with very little quartz, and accessory minerals as tourmaline, titanite/leucoxene, chlorite, chloritoid and zircon. Geochemically those rocks are characterised by the following bulk composition: SiO₂ 35,4; TiO₂ 5,4; Al₂O₃ 22,3; FeO (total) 26,7; MnO 0.1; MgO 1.5; CaO 0.5; Na₂O 0.3; K₂O 7.9; P₂O₅ 0.4 (average of 39 samples in weight %). This geochemistry is not compatible with its igneous characteristics like dykes that cut older lithologies, sericite as pseudomorphs after feldspar, gradation between meta-magmatites and hematitic phyllites, preserved subophitic to ophitic textures. Considering the whole set of data, it is admitted that these rocks represent the produce of a low grade metamorphism on an igneous sequence which suffered surficial alteration processes, locally representing paleosols of about 1.7 Ga. Associated with these lateritization profiles chloritoid rocks occur. They are interpreted as metamorphosed bauxites. The high Potassium values, uncommon in recent soils are due to the missing of a vegetation cover during Proterozoic times.