Multidisciplinary study of Santa Eulalia Plutonic Complex (Central Portugal): Preliminary insight

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The Santa Eulália Plutonic Complex (SEPC) is a late-Variscan calcalkaline granitic body that occupies an area of 400 km^2 and is located in the Variscan Iberian sector. The host rocks of the complex are composed by metamorphic formations from Proterozoic to Lower Paleozoic. The SEPC has two main facies which present different compositions and textures. From the rim to the core, there is a medium- to coarse-grained pinkish granite (G0) involving large masses of mafic to intermediate rocks and a central gray monzonitic granite (G1). The central facies can be divided into a porphyritic facies (G1A) and a central medium-grained facies (G1B). Multidisciplinary studies that include petrography, mineral and whole-rock chemistry, Anisotropy of Magnetic Susceptibility (AMS) and microstructural analyses were carried out. Besides petrographic and mineral chemistry data, whole-rock analytical results reveal clear differences between these two main granitic facies. G0 granites represent more evolved liquids (>SiO_2 wt.% and <MgO wt.%), plot closer to metaluminous and A-type fields, and present negative Eu anomalies, while G1 facies are typically monzonitic granites with a strong peraluminous character. The AMS study was based on 50 sampling sites. The magnetic susceptibility ranges between 55.09 and 7343.67 x 10^{-6} SI. Two major groups can be established: facies G0, with Km > 10^{-3} SI which supports the presence of magnetite, and the central facies (G1A, G1B) with Km< 10^{-4} SI. In the central facies the paramagnetic behaviour is due to ferromagnesian minerals, such as biotite, and ilmenite. Magnetic anisotropy ranges between 2.2 and 18.2% being in mean >5% in facies G0 and <4% in the central facies. The high P% in G0 facies may be caused by the magnetic bearer, magnetite. Nevertheless, microscope observations show signs of a post-magmatic deformation in G0. These preliminary data support that the facies G0 and the central facies (G1) have a distinct magnetic behaviour which may suggest different redox conditions in magma genesis.

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Fe(II) and organic exudates interaction in seawater

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Fe(II) oxidation kinetic was studied in seawater and in seawater enriched with exudates excreted by *Phaeodactylum tricornutum*. The exudates produced after 2, 4 and 8 days of culture at $6.21 \cdot 10^7$ cell/L, $2.29 \cdot 10^8$ cell/L and $4.98 \cdot 10^8$ cell/L were selected. The effects of the pH (7.2-8.2), temperature (5-35°C) and salinity (10-36.72) on the Fe(II) oxidation rate were studied. All the data was compared with the results for seawater without exudates (seawater control). The Fe(II) rate constants decreased as a function of culture time and cell concentration at different pH, temperature and salinity. The experimental data was fitted to a polynomial function in order to quantify the fractional contribution of the organic exudates from the diatoms to the Fe(II) oxidation rate in natural seawater. Experimental results showed that the organic exudates excreted by *Phaeodactylum tricornutum* affect the Fe(II) oxidation, increasing the life time of the Fe(II) in seawater. A kinetic model approach was carried out in order to account for the speciation of each Fe(II) species together with its contribution to the overall oxidation rate.