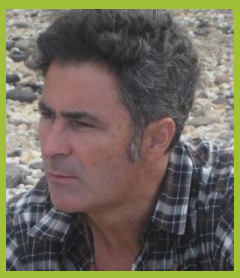
SCIENCESPRINGDAY

FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

Ciências da Terra Department

SHEAR ZONES, O and Hf isotopes & U-Th-Pb GEOCHRONOLOGY From the assemblage and break-up of Supercontinents to Gold metalogeny



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CENTRO DE INVESTIGAÇÃO EM CIÊNCIA E ENGENHARIA GEOLÓGICA UNIVERSIDADE NOVA DE LISBOA

FCT Fundação para a Ciência e a Tecnologia MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA

Objectives

♦ **Assumption: -** Shear Zones are High deformed crustal segments affected by a non-coaxial component of ductile to brittle shearing. Most important world-wide Gold Deposits are inserted in Shear Zones. If metals concentration is synchronous with metamorphism, hydrothermalism and/or igneous activity, U-Th-Pb isotopes can be used to estimate the absolute age of each individual geological event related with the mobilization/concentration of metals.

♦ **Objective:** to characterize and constrain the timing of host rocks (stratigraphy), deformational history, magmatic, metamorphic, and hydrothermal events by *in situ* Zircon U-Th-Pb isotopic absolute ages estimation. The comprehension of these multi-phased processes related with Metals concentration in Shear Zones is essential to guide the mineral exploration to new potential targets.

Methodology

♦ Multi-scale Geological mapping;
♦ Meso-Microstructural Analysis, Petrography of ductile to brittle tectonites **Fig.1a**,**1b**
♦ Lab 1. Heavy Mineral Separation and Selection of zircon crystals – **Fig. 2**;
♦ Lab 2. Cathodoluminiscence imaging analysis - **Fig. 2**;
♦ Lab 3. *in situ* zircon U-Th-Pb , O and Hf Isotopic analytical data acquisition by Sensitive High resolution Ion MicroProbe or Laser Ablasion Induced Coupled Plasma-Mass Spectometer - **Fig. 2**;
♦ Data processing
U-Pb Concordias – **Fig. 3**
Zircon age probability histograms **Fig. 4**;
Kolmogorov-Smirnov comparisons between zircon age spectra's of each sample;

Expected Results

♦ Constrain the timing of main stages of gold concentration;
♦ Identify the inheritance/provenance of igneous-sedimentary successions that host main ore deposits;
♦ Improve regional/global correlations between detached metalogenetic provinces and/or correlations between separated terranes.
♦ Produce a geochronological database to Iberia;
♦ Contribute to New Geological Maps (1/200000; 1/50000)
♦ Contribute to society and economic development of the country, formulating genetic models to guide mineral exploration.
♦ Keep collaborative research studies with national-international institutions and private companies and generate more International peer-reviewed publications;

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