



## **Origin and significance of the antimony mineralisation associated to mafic intrusions in the Iberian Zone and the Central Armorican Domain**

Eric Gloaguen, Héctor Campos, Anthony Pochon, Pablo León Higuera, Saturnino Lorenzo, José-María Esbrí, Giada Iacono-Marziano, Alexandre Lima

### **► To cite this version:**

Eric Gloaguen, Héctor Campos, Anthony Pochon, Pablo León Higuera, Saturnino Lorenzo, et al.. Origin and significance of the antimony mineralisation associated to mafic intrusions in the Iberian Zone and the Central Armorican Domain. vEGU21: Gather Online, Apr 2021, Online, France. <10.5194/egusphere-egu21-13154>. <hal-03554516>

**HAL Id: hal-03554516**

**<https://hal.science/hal-03554516v1>**

Submitted on 3 Feb 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons CC BY 4.0 - Attribution - International License

EGU21-13154, updated on 03 Feb 2022

<https://doi.org/10.5194/egusphere-egu21-13154>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Origin and significance of the antimony mineralisation associated to mafic intrusions in the Iberian Zone and the Central Armorican Domain

**Eric Gloaguen**<sup>1</sup>, Héctor Campos<sup>1</sup>, Anthony Pochon<sup>1</sup>, Pablo León Higuera<sup>2</sup>, Saturnino Lorenzo<sup>2</sup>, José-María Esbrí<sup>2</sup>, Giada Iacono-Marziano<sup>1</sup>, and Alexandre Lima<sup>3</sup>

<sup>1</sup>Université d'Orléans/CNRS/BRGM/ISTO, UMR 7327, F-45071 Orléans, France

<sup>2</sup>Instituto de Geología Aplicada & Departamento de Ingeniería Geológica y Minera. E.I.M.I. Almadén, Universidad de Castilla-La Mancha, Plaza Manuel Meca 1, E-13400 Almadén (Ciudad Real), Spain

<sup>3</sup>ICT – Polo do Porto, Departamento Geociências, Ambiente e Ordenamento do Território, Faculdade de Ciências, Universidade do Porto, Portugal

In the Central Iberian Zone (CIZ) and its French counterpart, the Central Armorican Domain (CAD), widespread swarms of mafic dykes with various ages and compositions are known. Indeed, numerous mafic events are recognized in the late Neoproterozoic, in the Cambrian to the Ordovician, in the Ordovician to the Devonian, at the Devonian-Carboniferous boundary, in the Permian and in the Jurassic. Such a succession of mantle partial melting events, localised or generalized, may have strong consequences (i) on the composition and the homogeneity of the mantle below both the CIZ and CAD, and (ii) on the transfert of metals in the overlying crust. Moreover, the mantle below these domains must have been modified also by the subduction of large to small oceanic crusts from the Iapetus, the Rheic, the Galicia-Moldanubian and the Paleotethys. Although the occurrences of paleo-subductions below the CIZ and CAD remain discussed, the southern border of the CIZ, the Ossa-Morena Zone (OMZ), is considered as a suture zone resulting from a subduction followed by a collision between 390 and 360 Ma (D1), according to the 2 opposite structural vergences at the CIZ/OMZ boundary, as well as the location of a NE-dipping slab imaged by seismic profiles. In the Armorican massif, the end of subduction is also dated at 360 Ma and associated to a north-directed subduction. The trace of this subduction below the CAD is visible in the tomographic dataset. Interestingly, these two domains (CIZ and CAD) contain the largest number of Palaeozoic antimony deposits, antimony being a volatile element. In these domains, the large clustering of antimony deposits and occurrences is observed within a ca 100km wide bands along their southern parts. In the two domains, the antimony deposits are frequently spatially associated with diabase dykes. Diabase dykes and associated antimony mineralisation have been dated at 360 Ma in the CAD but remain temporally unconstrained in the CIZ. Nevertheless, since these dykes are strongly affected by the Variscan deformation a minimum age of 350 Ma is inferred. Both, the peculiar composition of these diabase dykes, relatively enriched in Cs, Li, Pb and relatively depleted in K and Rb, the spatial association with antimony at the end of a 360Ma subduction, suggest a link between antimony and a ca 360Ma mafic magmatism which could result from the partial melting of a subduction-related metasomatized mantle.

This work was funded by the ANR (ANR-19-MIN2-0002), the AEI (MICIU/AEI/REF.: PCI2019-103779), the FCT (ERA-MIN/0005/2018) and author's institutions in the framework of the ERA-MIN2 AUREOLE project (<https://aureole.brgm.fr>).