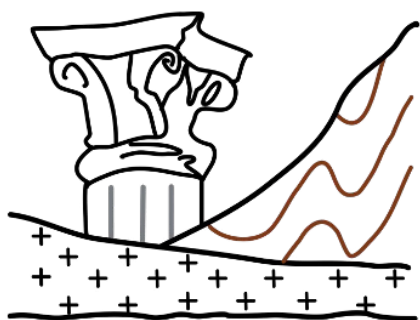




# **XII Congresso Nacional de Geologia**

*Évora, 21 a 26 de Junho*

*Alentejo, onde a Geologia tem Espaço e Tempo*



## **Livro de Resumos**

**Coordenado por:**

*Pedro Nogueira, José Roseiro e Noel Moreira*

## Uma Organização de:

Sociedade Geológica de Portugal



Departamento de Geociências da Escola de Ciências e Tecnologia da Universidade de Évora



Instituto de Ciências da Terra



Laboratório HERCULES



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Pedro Nogueira; Alexandre Araújo; Pedro Dinis; José Carlos Kullberg; Ruben Martins; João X. Matos; Patrícia Moita; Noel Moreira; José Roseiro.

## Ficha Técnica:

**Editor:** Universidade de Évora

**Suporte:** Eletrónico

**Título:** XII Congresso Nacional de Geologia – Livro de resumos

**ISBN:** 978-972-778-551-3

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## Between bending and passive flow folding: preliminary data from the Aguiar marble enclave (Évora Massif, Ossa-Morena Zone, Portugal)

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### Resumo

Deciphering deformation processes related to the development of migmatites is one of the most complex challenges of petrogenetic processes, which should always include significant structural control. Crustal melting and related high-grade metamorphic rocks, like migmatites, can be generated at temperatures as low as about 630°C (Barker, 1998) coetaneous with melting flow and ductile deformation, often creating chaotic ptygmatic folds. However, at these temperatures, carbonate rocks typically do not undergo partial melting due to their chemical composition and thermal behavior, which depend on metamorphic reactions involving non- carbonated phases. Therefore, the partially molten crust mostly uptake siliciclastic/metapelite successions to give rise to migmatite sequences, in contrast to the refractory carbonate rocks. Instead of melting, at temperatures up to 850°C the carbonate rocks tend to recrystallize, undergo decarbonation and often generate calc-silicate rocks. For carbonate melting occurs, either extremely high temperature conditions, or specific fluids are required to promote melting reactions. In the Évora Massif (Carvalhosa, 1983), Ediacaran (Escoural Fm. [Série Negra]) and Cambrian (Monfurado Fm.) successions underwent HT-LP metamorphism during the prograde stages (650–750°C, 2–4 kbar; Pereira et al., 2007), and the siliciclastic lithotypes initiated the process of partial melting. However, marbles from the Monfurado Fm. did not, currently constituting cartographic scale enclaves within Lower Carboniferous Variscan migmatite domes, like the Aguiar marble enclave. The high temperature shearing processes exhibit completely distinct rheological behavior between the migmatites and the marble enclaves: while the migmatites show ptygmatic folds conditioned by migmatite flow and simple shear along sinistral shear zones, the Aguiar marble enclave deforms passively, either through bending of the previously deformed metamorphic banding or by passive flow, particularly near the enclave boundaries, where the flow resulting from the rheological contrast becomes noticeable. Indeed, the Aguiar marble enclave shows non-cylindrical folds at cartographic scale, with large interlimb angles, like a rigid body (marble enclave) sinking into a lower viscous material (migmatites).

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### **Agradecimentos**

Os autores agradecem o apoio financeiro concedido ao Instituto de Ciências da Terra (ICT) através do contrato de financiamento plurianual celebrado com a Fundação para a Ciência e a Tecnologia (FCT), no âmbito do projeto UID/04683/2025 (<https://doi.org/10.54499/UID/04683/2025>).