

1. Background

What	 Strata-bound tin (Sn) mineralisation hosted by schists.
Where	Bockau, Western Erzgebirge, zone of high defo former passive margin of Gondwana.
Age Constraints	 Sn mineralisation (395-365 Ma) younger than provider than post-orogenic granites (Romer et al. Mineralisation age concurs with metamorphic and the second secon
Source	 Protoliths: intensely weathered, feldspar-free E Ordovician shales (containing low Na, Ca, Sr, Pl Sn contents (~15-20 ppm) higher than typical si sediments (~5-10 ppm).
End Products	 High Sn content (~250 ppm, locally up to 2500 p prominent increase during metamorphism. Sn sequestered as aggregates and inclusions o cassiterite associated with metamorphic mineral
Research Questions	 Role of protoliths for Sn enrichment in the schi Which processes govern metamorphism and S enrichment? Which elements were mobile together with Sn?

4. Mineral chemistry



Fig. 7: BSE image of cassiterite inclusions within chloritised biotite.

- Alteration of biotite releases Sn (Fig. 9).
- Some of the Sn is scavenged by secondary muscovite, (Fig. 9) some Sn forms cassiterite.
- Chlorite has low Sn contents (Fig. 9).



chloritised biotite.



Fig. 9: SnO₂ vs K₂O plot showing variable Sn content in the

References

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- depositional environment: a 250 Ma record from the Cadomian orogeny to the Variscan orogeny. Gondwana Research, 26, pp. 1093-1110.

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2. Field observations: Sn enriched schists



5. Comparison of Sn rich schists and their protoliths







respectively.

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Fig. 2: Heterogeneous Sn distribution with high values (up to 2500 ppm) of Sn along 1, 2, 3 and 4; intermediate zones contain around 50 ppm Sn.



Fig. 3. Typical mica schists of Bockau, high Sn zones marked by dashed lines.





Fig. 4: Zoned, euhedral cassiterite with biotite in prograde texture.

- At least 2 stages of Sn mobilisation:







3. Petrography





associated with chloritised biotite.

Fig. 6: Cassiterite aggregates along the borders of folded quartz layer.

-prograde metamorphism: zoned, euhedral cassiterite associated with Sn-rich biotite (Fig. 4). -retrograde metamorphism: Sn released from biotite. Aggregates of fine secondary cassiterite associated with and included within chloritised biotite (Fig. 5, 7, 8).

• Sn mobilisation is related to progressive deformation in the schists, shown by fine cassiterite aggregates around folded quartz layers and in the pressure shadows (Fig. 6).



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