Shine On You Crazy Scheelite:
Unraveling micro-textures of scheelite from the Eastern Alps

Altenberger, Florian* & Raith, Johann G.

INTRODUCTION

The principal carrier of tungsten in the Eastern Alps is **scheelite ($CaWO_4$)**, which occurs in different mineralization styles. This study is part of the **"W Alps"** project which re-investigates the tungsten potential in the Eastern Alps using a combined analytical approach (CL, trace elements).

Scheelites from the economic W mine in Felbertal (Salzburg) and those from many smaller sub-economic W occurrences are compared. Micro-textures of scheelite from different mineralization styles all over the Eastern Alps were investigated, including:

Strata-bound	Skarn-type	Orogenic Au-(W)
Felbertal [1]	Messelingscharte [5]	Schellgaden [7]
Mühlbach [2]	Lienzer Schlossberg [6]	
Tux-Lanersbach [3]		
Mallnock [4]		

METHOD

UV-Fluorescence and **cathodoluminescence (CL)** was used to reveal complex micro-textures and zoning in scheelite to discriminate different mineralization environments. CL imaging was conducted using a Superprobe JEOL JXA 8200 equipped with a CL detector.

RESULTS OF CL STUDIES

- Magmatic-hydrothermal scheelites may preserve a distinct **primary zonation** (Fig.1)
- "Metamorphic" scheelites (i.e. lacking granitoids) show **homogeneous** internal micro-textures (Fig. 2)
- Deformation and metamorphic overprint result in specific cataclastic and recrystallization textures
- Localized remobilization leads to formation of several scheelite generations (Fig. 3)
- Intensity of luminescence and zoning is not only related to MoO_3 wt.%, but also to other trace elements

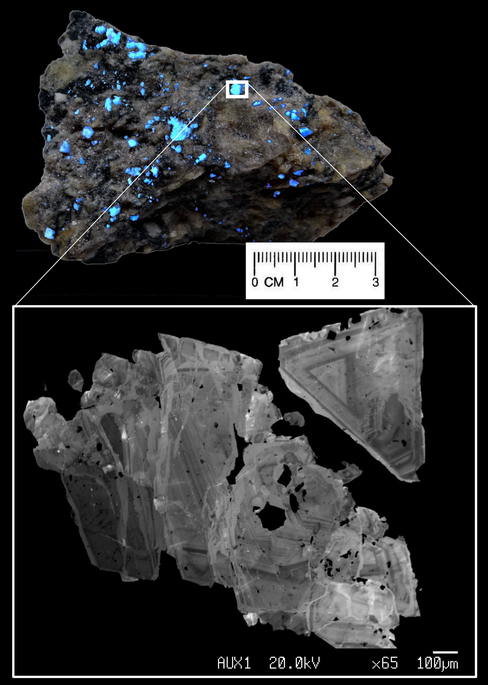

Fig. 1: Primary zoning in scheelite of (magmatic?)-hydrothermal origin (Lienzer Schlossberg)

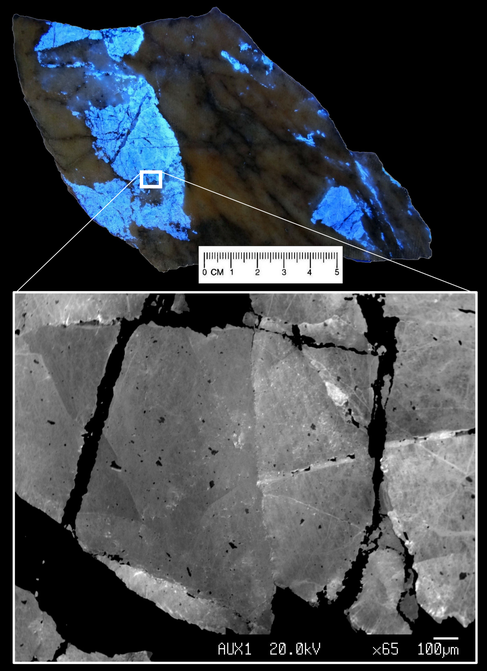

Fig. 2: Homogeneous scheelite of metamorphogenic origin (Schellgaden)

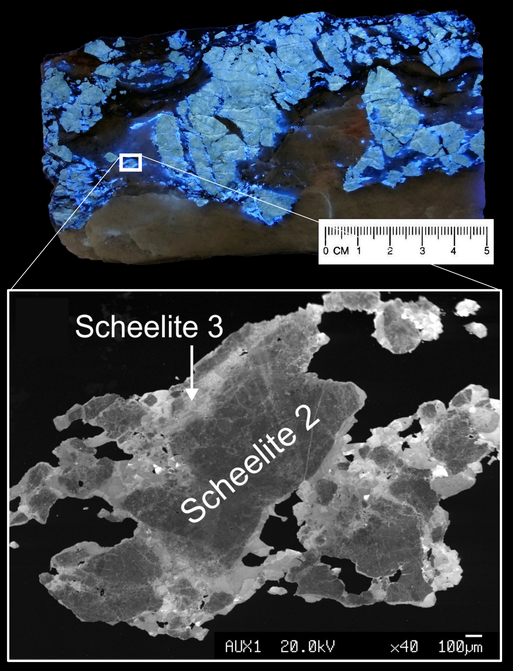

Fig. 3: Magmatic-hydrothermal scheelite 2 is replaced by metamorphic scheelite 3 (Felbertal)

SUMMARY

- Scheelites of different origin can be distinguished by their micro-texture
- Distinction of several scheelite generations by cross-cutting relationships and replacement textures
- Deformation and crystal orientation affect luminescence
- CL is useful to reveal micro-textures in order to investigate trace element distribution by LA-ICP-MS

REFERENCES

1. Kozlik et al. (2015), *Strontium isotope systematics of scheelite and apatite from the Felbertal tungsten deposit, Austria – results of in-situ LA-MC-ICP-MS analysis.* Min. Pet., **110**(1): S. 11-27.
2. Neinavaie & Pfeffer (1981), *Scheelite mineralization in Innsbruck quartz phyllites of Muhlbach Valley, Oberpinzgau.* Anz. Akad. Wiss. Wien, **118**(9): S. 185-186.
3. Raith et al. (1995), *Polymetamorphism and polyphase deformation of the strata-bound magnesite-scheelite deposit, Tux-Lanersbach, Eastern Alps, Austria.* Econ. Geol.,**90**(4): S. 763-781.
4. Neinavaie et al. (1989), *Wolframite- and scheelite-bearing carbonate rocks of the Nock Mountains, Austria; a new type of tungsten mineralization in the Eastern Alps.* Min. Dep., **24**(1): S. 14-18.
5. Ordosch et al. (2019), *Polyphase scheelite and stanniferous silicates in a W-(Sn) skarn close to Felbertal tungsten mine, Eastern Alps.* Min. Pet., **113**(5): S. 703-725.
6. Fuchs (1982), *Magnetkies- und Scheelitanreicherungen in den "Alten Gneisen" des Lienzer Schloßberges (Osttirol).* Arch. Lagerstättenforsch. Geol. Bundesanst., **2**: S. 67-70.
7. Wieser et al. (2010), *In-situ trace element and ID-TIMS Sm-Nd analysis of scheelite and Re-Os dating of molybdenite at Schellgaden, a Au-(W) deposit in the Eastern Alps, Austria*. Pangeo 2010 Abstr., J. Alp. Geol., **52**: S. 253-254.

Chair of Resource Mineralogy | Montanuniversität Leoben | Peter-Tunner-Straße 5, 8700 Leoben, Austria
* Corresponding email: florian.altenberger@unileoben.ac.at

DMG Deutsche Mineralogische Gesellschaft — Virtual Poster-Session 2020