

SEM-based mineralogical characterization of artisanal tin tailings from Rondônia, northwestern Brazil

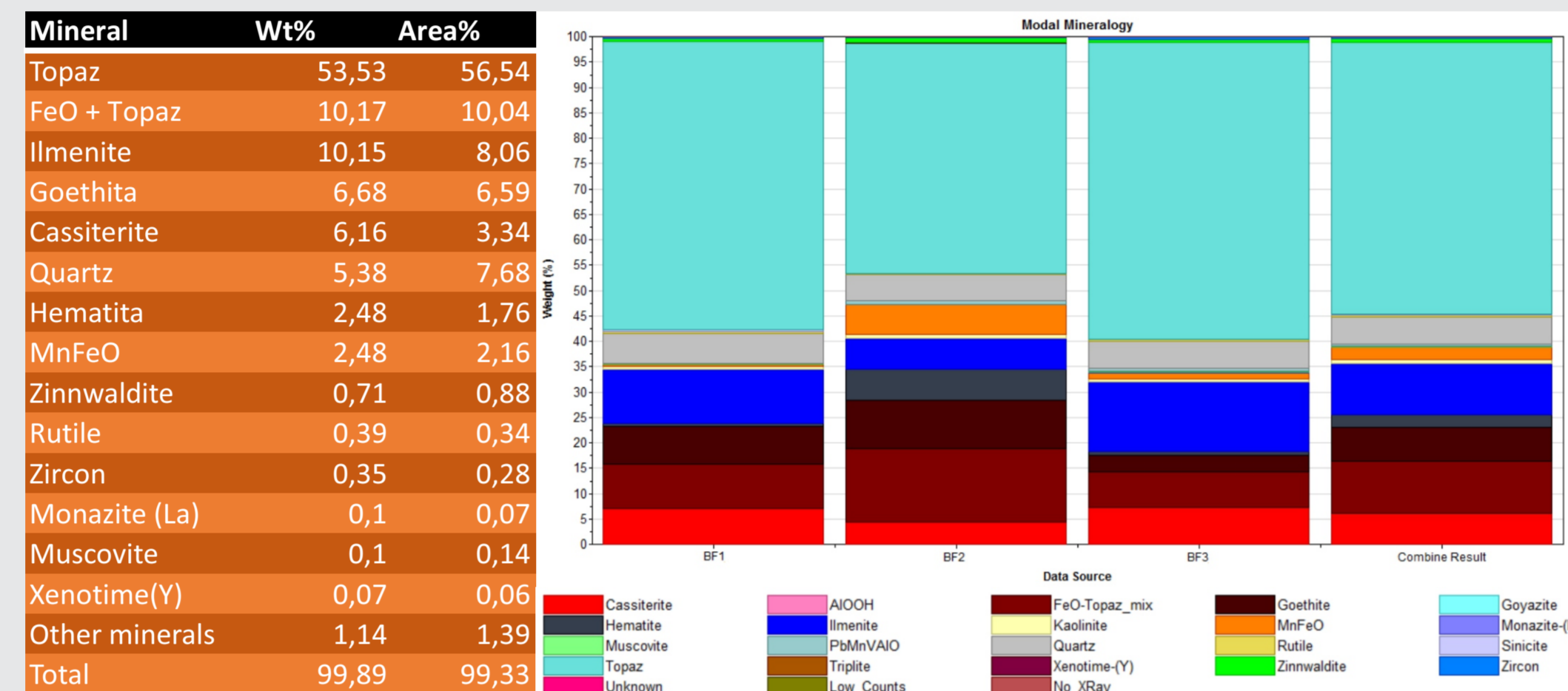
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Introduction: Located in NW of Brazil, the Rondonia Tin Province is known by its tin deposits associated with several A-type granite suites. Associated with tin, other elements may occur as byproducts, in the primary and secondary ores, or accumulated in the tailings of the existing mining operations in the region. This study is a first glance in the tailings of Bom Futuro, a tin deposit in the centre-north portion of the state. The technique used is the Mineral Liberation Analyzer (MLA) and the analyzed material is a washed and sieved tailing, collected before the jigging process.

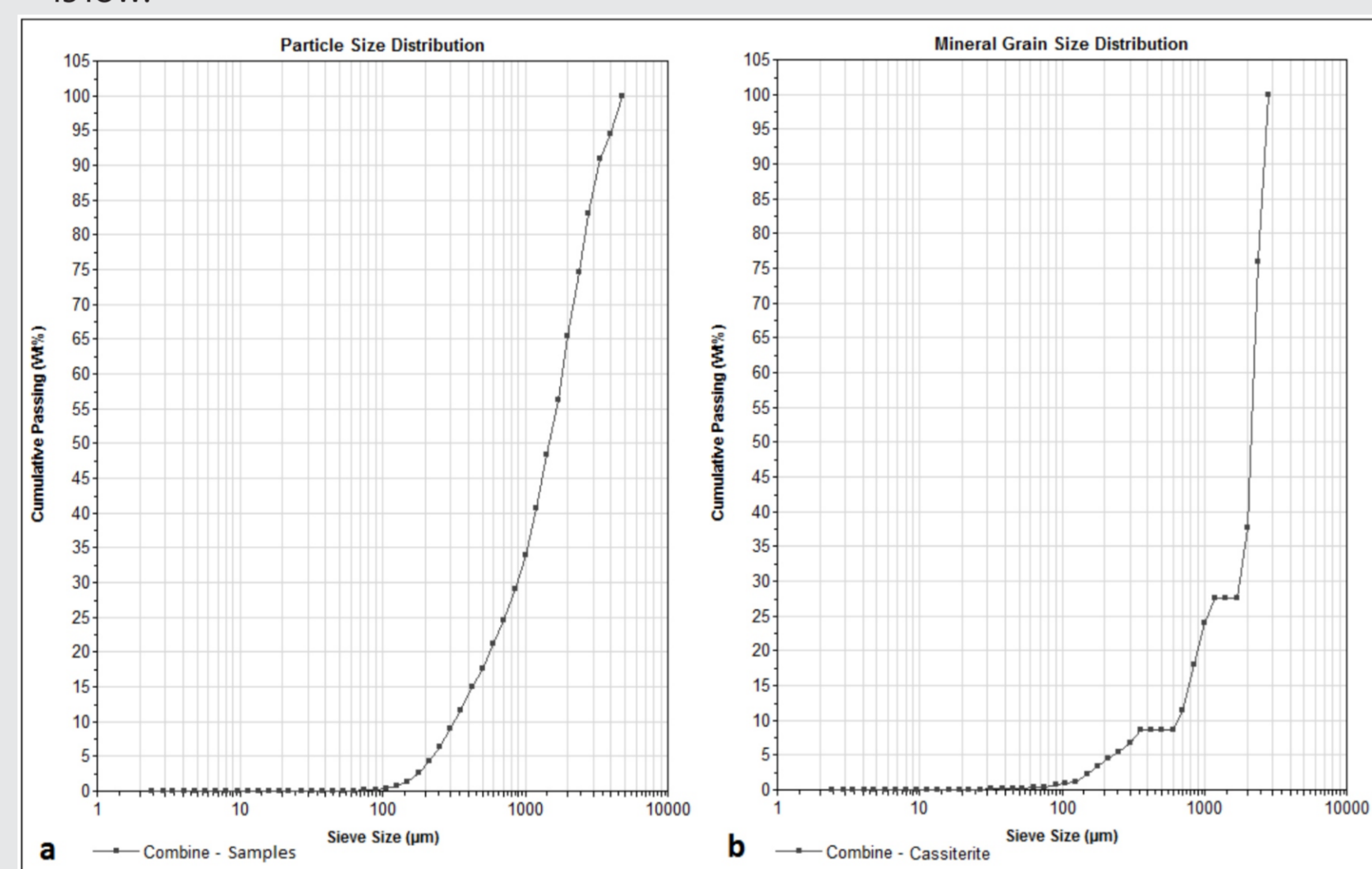
Steps of sample preparation and MLA measurement:

- ☑drying and splitting;
- ☑magnetic separation;
- ☑three aliquotes;
- ☑MLA analysis in TUBAF geometallurgy laboratory.

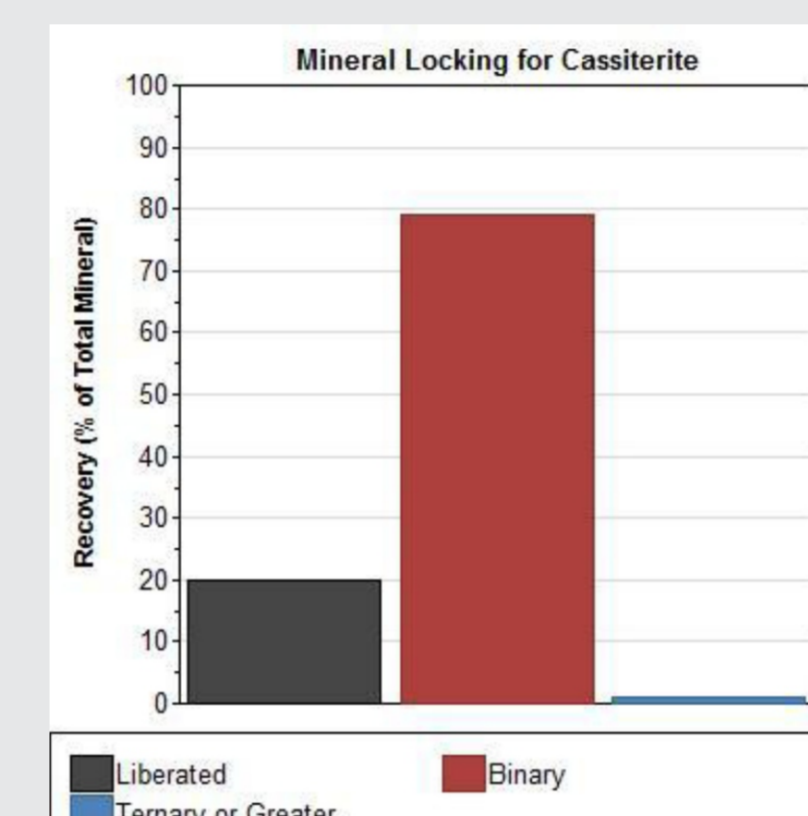
Results



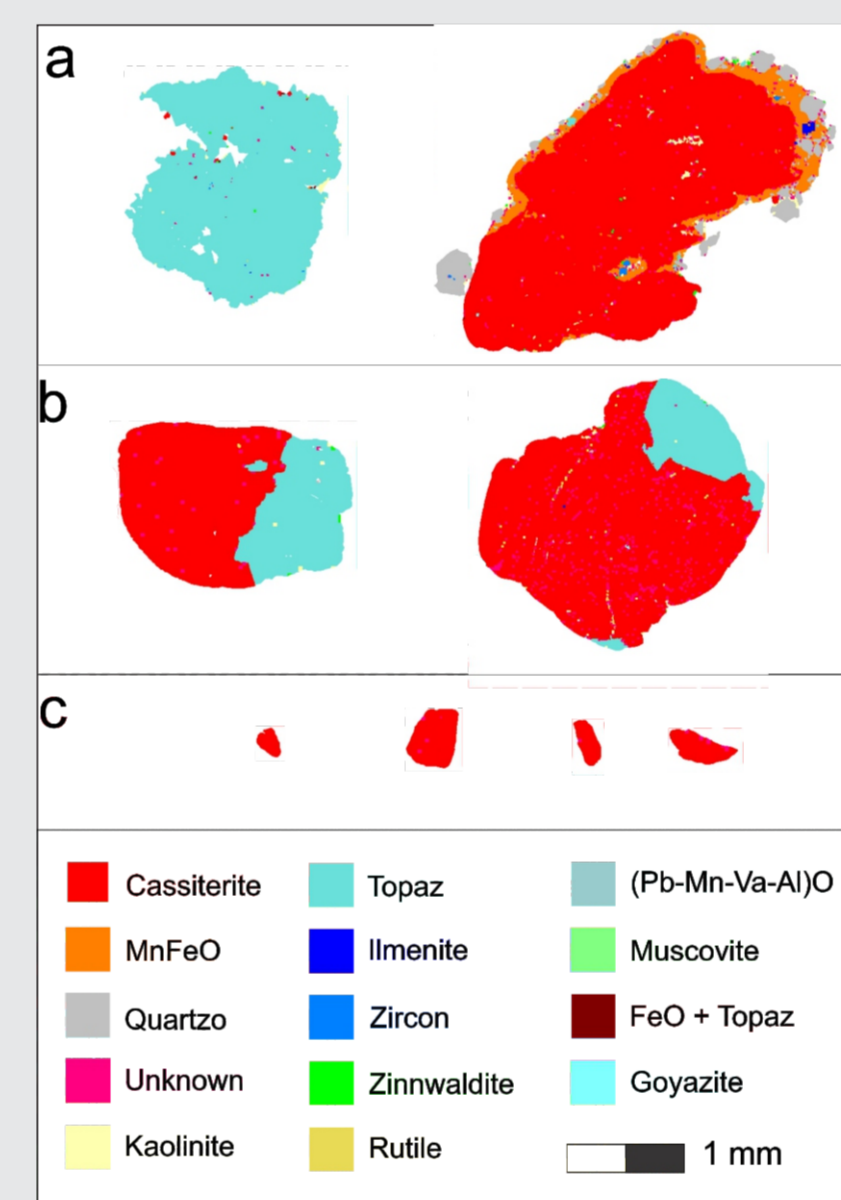
Modal Mineralogy of the combined samples. Topaz is the main mineral followed by ilmenite and Mn-Fe oxides. Cassiterite content is nearly 6%. The content of REE minerals is low.



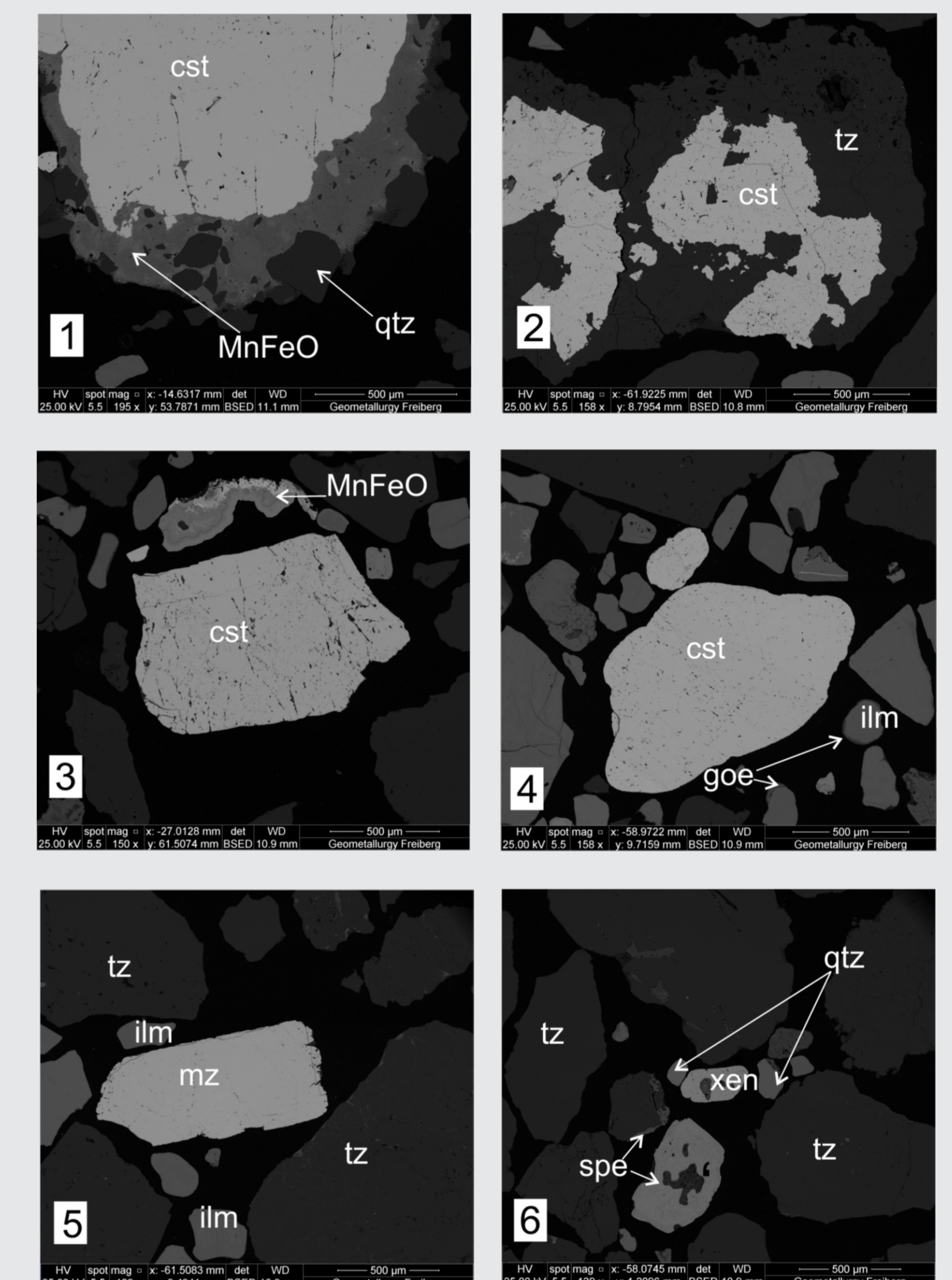
a - Combined particle size distribution; b - Cassiterite size distribution from the 3 samples.



Graphic representation from the mineral locking for cassiterite.



a - Ternary locking from the cassiterite; b - binary locking of cassiterite with topaz intergrowth; c - thin liberated cassiterite.



1 - cassiterite grain involved by Mn-Fe oxide and quartz; 2 - intergrowth of cassiterite and topaz; 3 - liberated cassiterite grain among free Mn-Fe oxide; 4 - liberated cassiterite grain among ilmenite grains involved by goethite; 5 - monazite grain; 6 - sparse xenotime grain.

Conclusion

- ☑Monazite and xenotime are roughly separated, indicating preferential flow along with the cassiterite concentrate;
- ☑Even with the available data no significant concentration of REE minerals has been found, the studied sample represents tailing material, thus some potential for a possible REE source is suggested;
- ☑SEM-based MLA may form an important tool to profoundly assist in a higher recovery of cassiterite at the Garimpo Bom Futuro.

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