

Stellar Resources

Ramsay RY02 Prospect

Panned Concentrate Mineralogy

SEPTEMBER 2014



McArthur Ore Deposit Assessments Pty Ltd

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STELLAR RESOURCES

Ramsay RY02 Prospect Panned Concentrate Mineralogy September 2014

Method

An unsized panned concentrate made from creek sediments at Stellar's Ramsay RY02 Tin Prospect was submitted by consultant geologist Ken Morrison for mineralogical assessment. The sand was mounted as a polished thin section by Australian Petrographics (Queanbeyan, NSW) and also submitted to McKnight Mineralogy (Ballarat) for Quantitative X-Ray Diffraction (QXRD) analysis.

A combination of quantitative and qualitative microscopy was undertaken by MODA.

To quantify the mineralogy, the polished section mount was scanned on two arbitrary lines, logging 400 grains. A visual estimate was made of the area% of each mineral present within each grain. This provided an overall composition and mineral associations.

Each polished section was then examined qualitatively and several photomicrographs captured to illustrate the mineral species present. All images were annotated using PowerPoint.

Results

Composition - QXRD

McKnight Mineralogy reported the following "semi-quantitative" composition (wt%):

MINERAL	Ramsay RY02 P/C
Magnesiochromite	45.6
Quartz	22.0
Ilmenite	14.4
Cassiterite	8.5
Dravite (tourmaline)	4.7
Zircon	3.6
Rutile	1.2
Diopside	tr
Topaz	tr

It was noted by McKnight that the quantification by QXRD of *cassiterite* in the presence of *quartz* is troublesome, and the content above is very approximate.

Composition – Optical Microscopy

The optical microscopy encountered <1wt% of an unidentified gangue mineral that was in characteristic radiating acicular clusters. The optical logging gave the following results (wt%):

MINERAL	Ramsay RY02 P/C
Magnesiochromite	46.8
Ilmenite	26.2
Quartz	15.0
Tourmaline	4.5
Cassiterite	3.6
Rutile	2.2
Zircon	1.2
Other	0.7

The match with the QXRD composition is reasonable, given the samples were split arbitrarily. Based on theoretical mineral compositions, this sample could be expected to assay:

25%Cr, 17%SiO₂, 16%TiO₂, 10%MgO, 10%Fe, 3%Sn, 2%Al₂O₃, 1%Zr

Textural Features

Magnesiochromite (chrome spinel):

- Water-worn, uniformly sized crystals, often with planar faces
- Mostly opaque, but some crystals were deep red using intense transmitted light
- Monominerallic, liberated
- Some grains showed a characteristic “crazed” fracture pattern

Ilmenite:

- Water-worn, variable size grains, sometimes with deep fractures
- Some grains showed some vague mauve tinges, typical of *ilmenite*
- Some grains were binary composites with *quartz*

Quartz:

- Water-worn, variable size grains, generally coarse-grained (no chert)
- Also as binary composites with *ilmenite*, *tourmaline* and *cassiterite*

Tourmaline:

- Water-worn prismatic crystals of variable colour, but mainly brown/green/blue
- Characteristic composites with *quartz* and *ilmenite* common

Cassiterite:

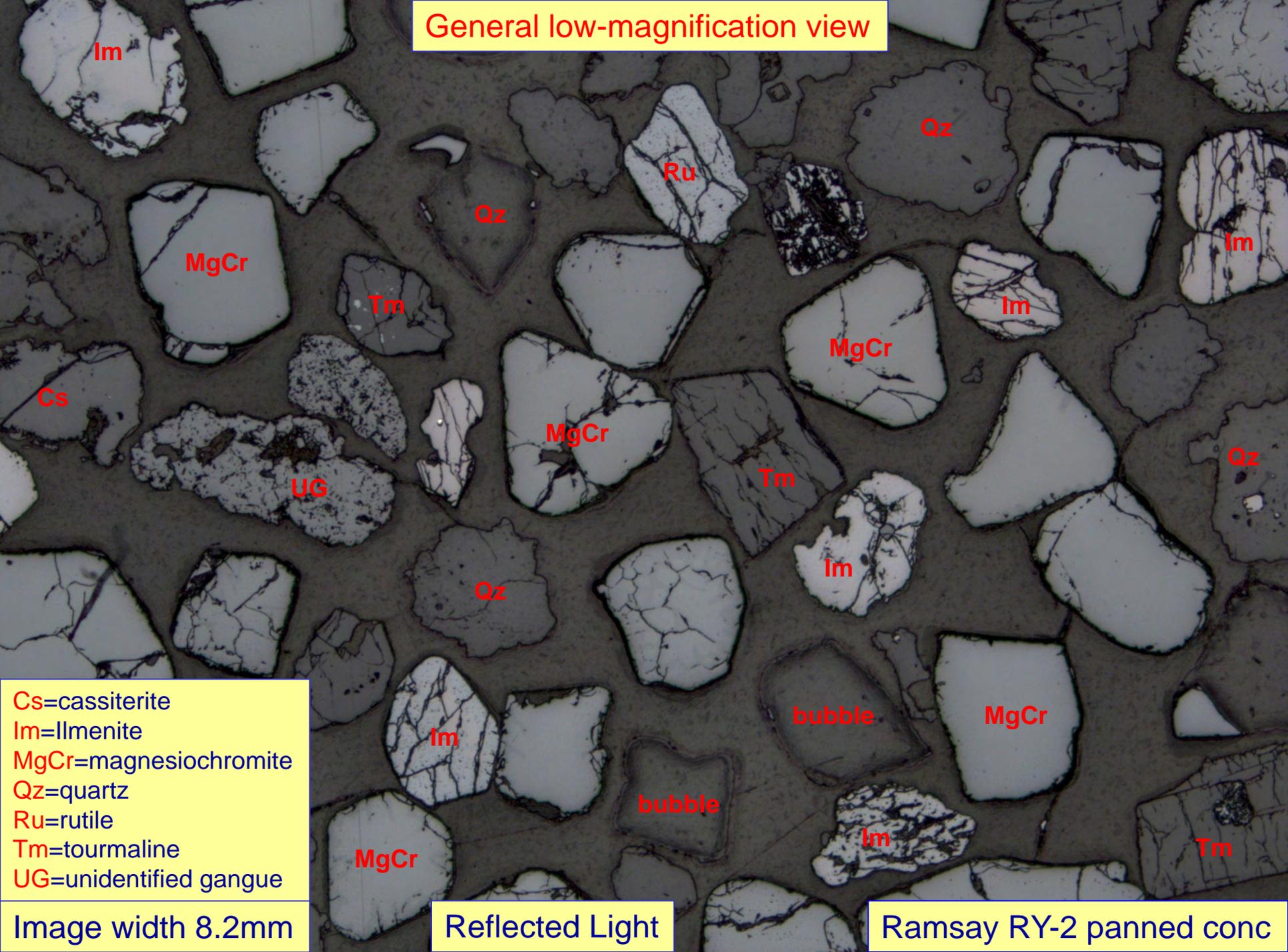
- Water-worn, variable size, equant crystals showing colourless to brown colour zonation
- Rare in binary composites with *quartz*

Zircon:

- Barely eroded small, colourless crystals showing characteristic zonation features

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25.9.14

General low-magnification view



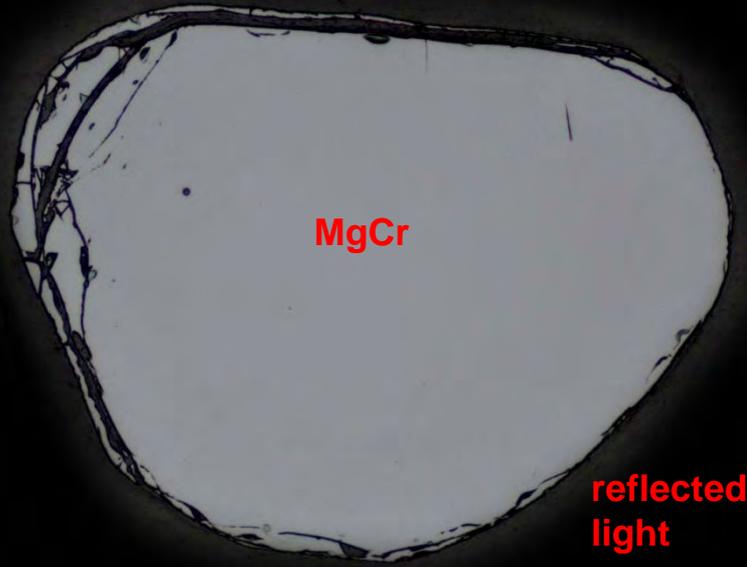
Cs=cassiterite
Im=Ilmenite
MgCr=magnesiochromite
Qz=quartz
Ru=rutile
Tm=tourmaline
UG=unidentified gangue

Image width 8.2mm

Reflected Light

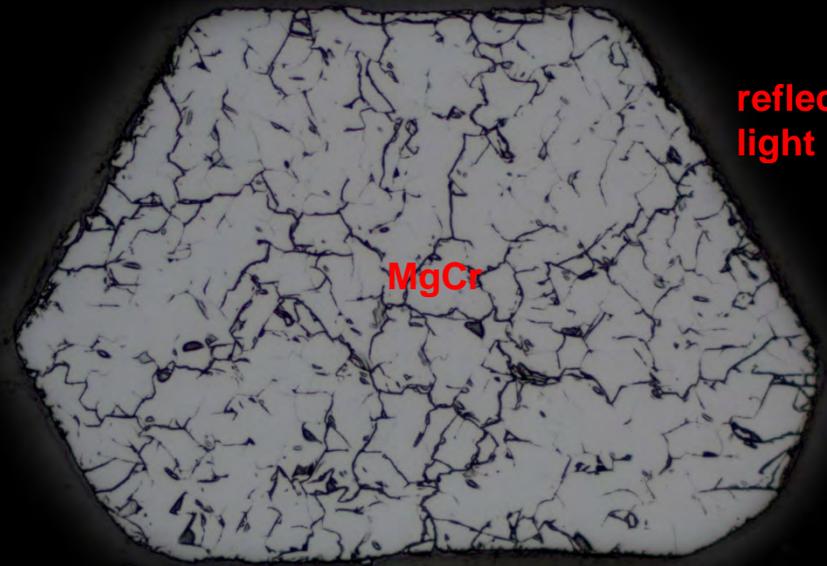
Ramsay RY-2 panned conc

Magnesiochromite and ilmenite



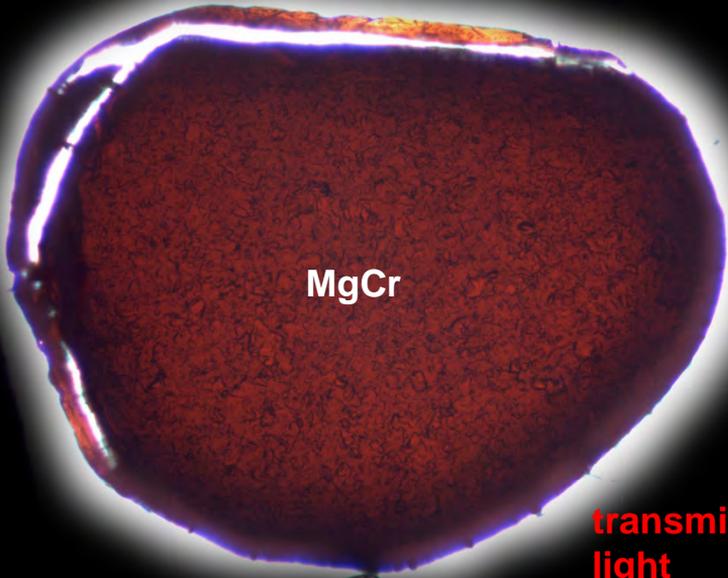
MgCr

reflected
light



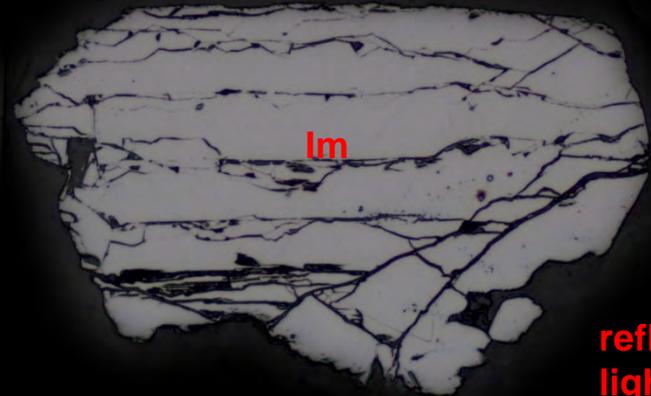
MgCr

reflected
light



MgCr

transmitted
light



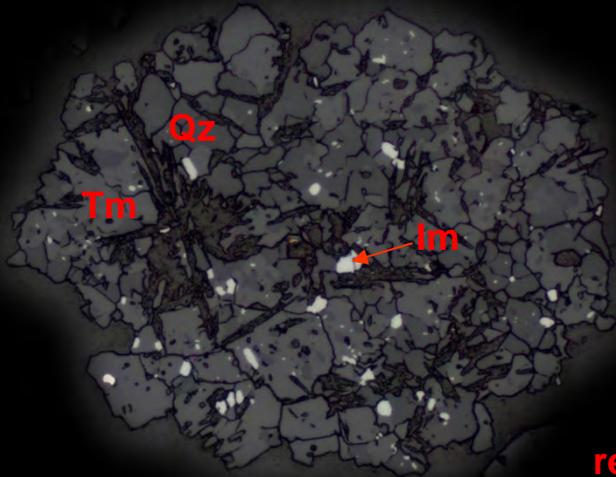
Im

reflected
light

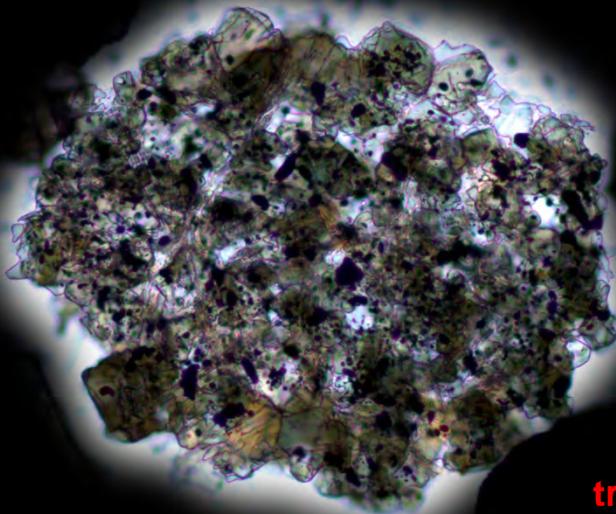
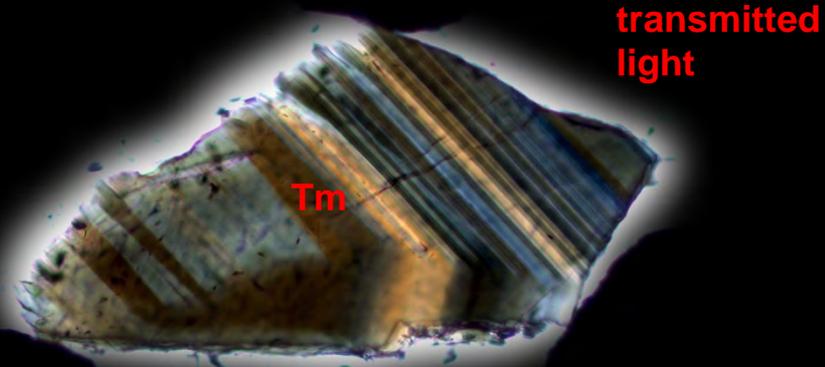
Image width 1.0mm

Ramsay RY-2 panned conc

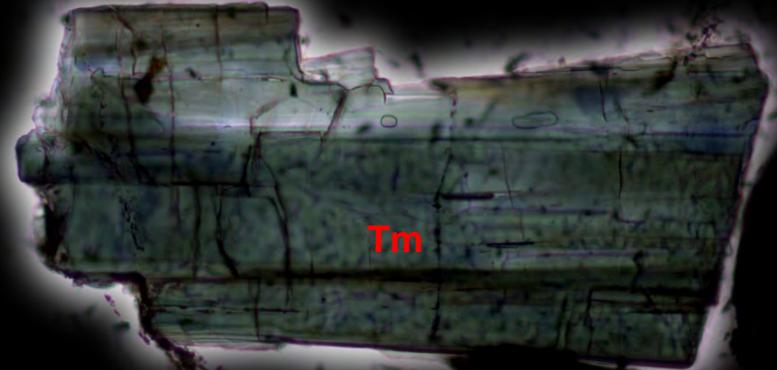
Tourmaline



reflected
light



transmitted
light



transmitted
light

Image width 1.0mm

Ramsay RY-2 panned conc

Tourmaline-quartz intergrowth

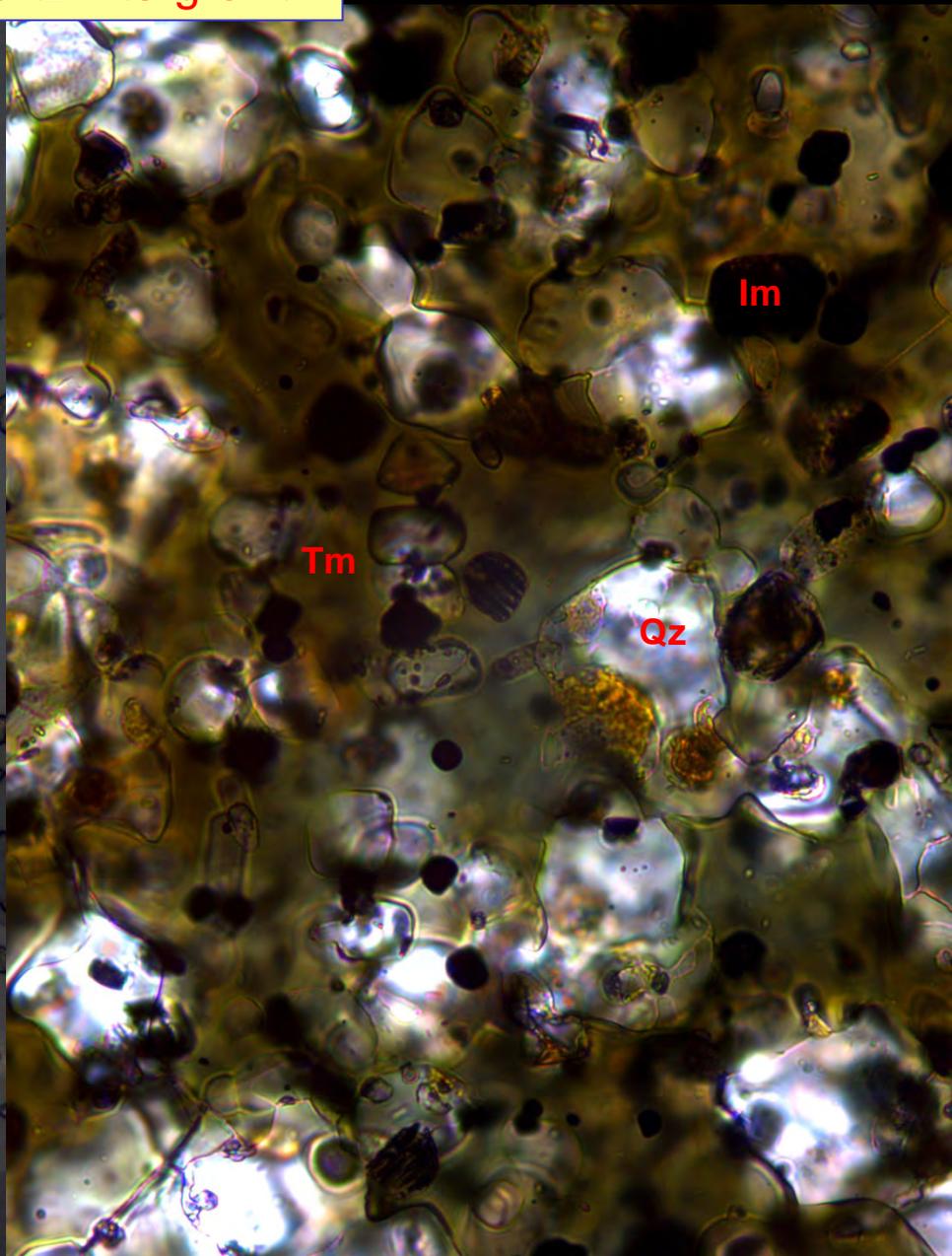
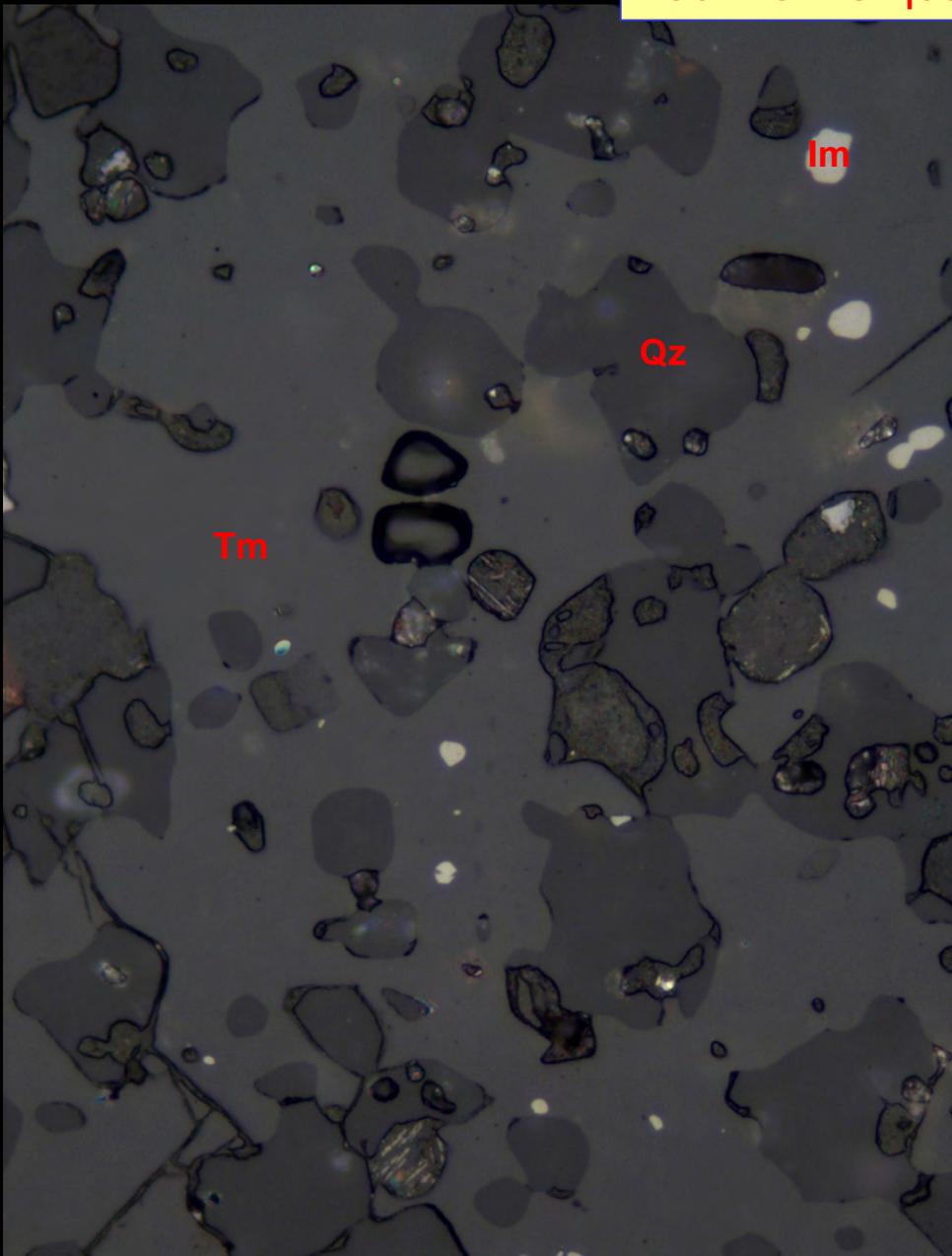


Image width 2 x 206µm

reflected
light

transmitted
light

Ramsay RY-2 panned conc

Cassiterite

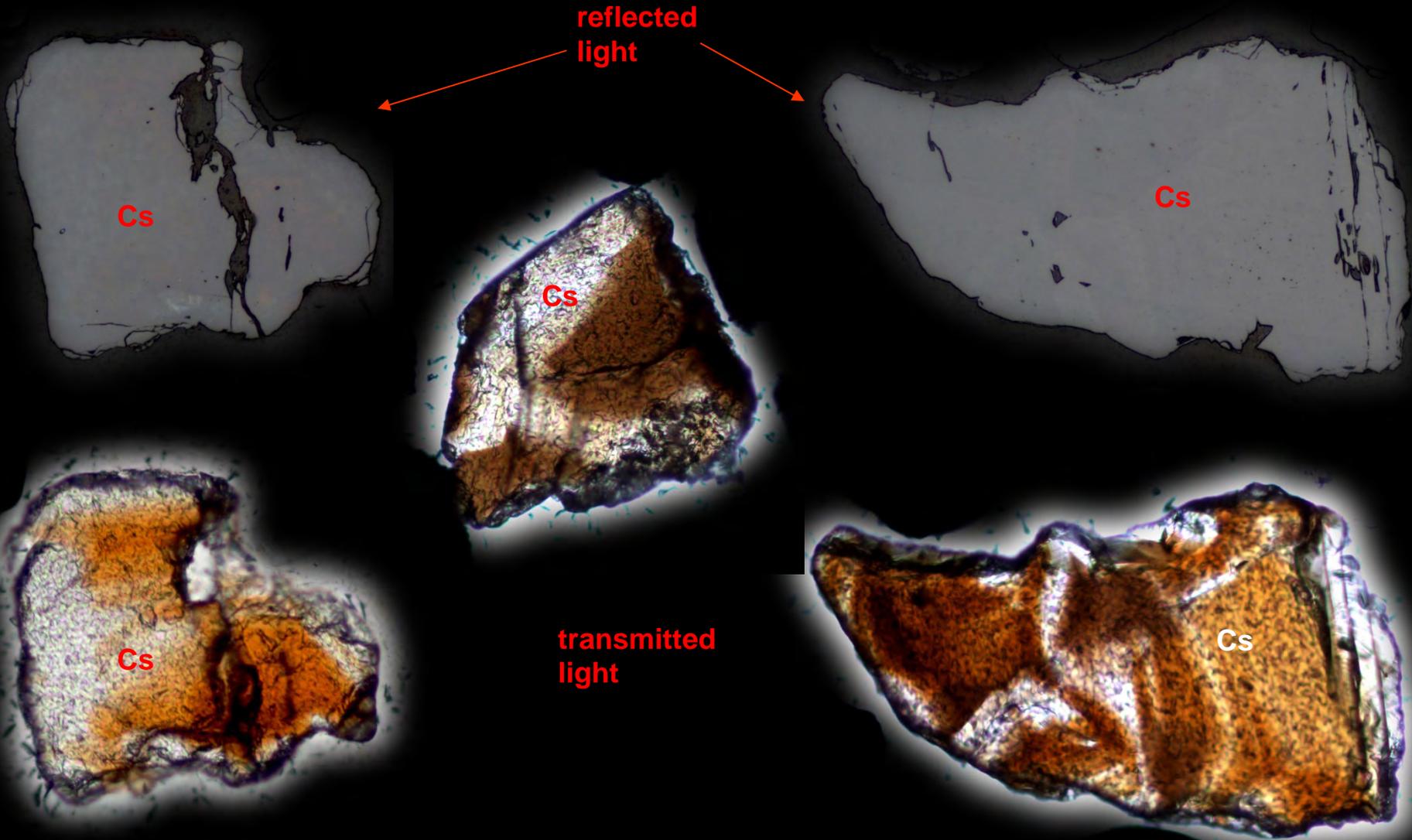
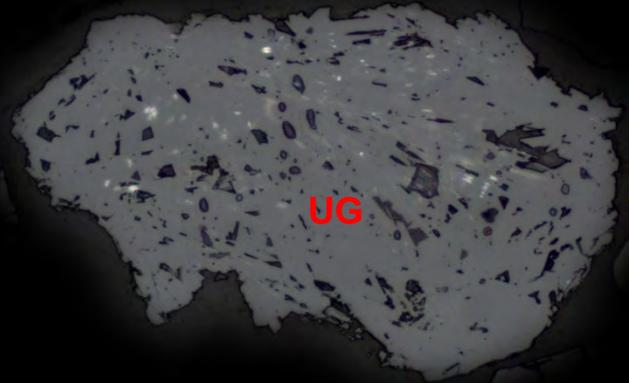


Image width 1.0mm

Ramsay RY-2 panned conc

Other minerals



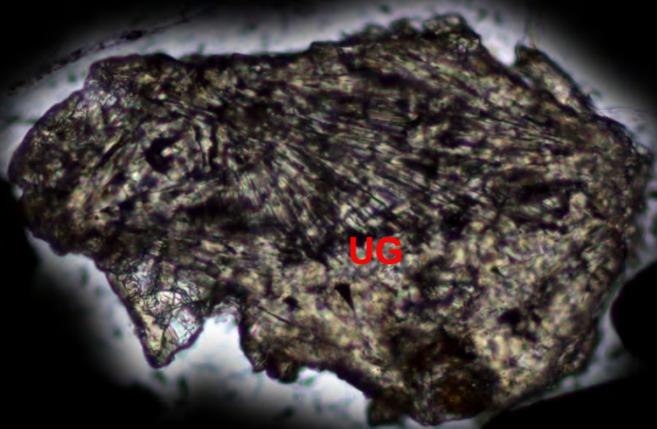
UG

reflected
light



Zr

Unidentified radiating acicular clusters, high relief



UG

transmitted
light



Zr

transmitted
light (x-nicols)

Image width 1.0mm

Ramsay RY-2 panned conc