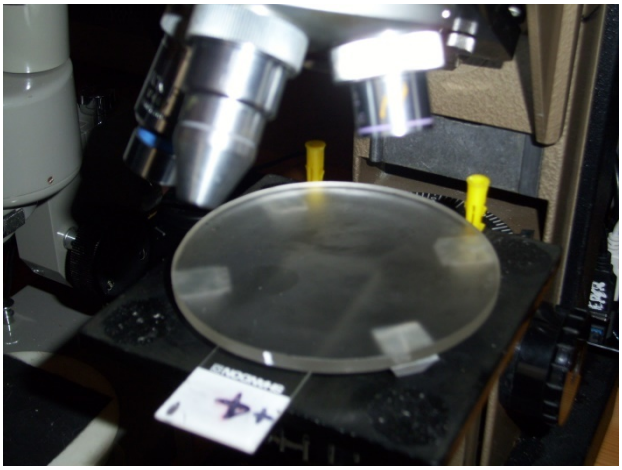
MICROSCOPICAL EXPLORATION TWENTY THREE

ANOTHER QUALITATIVE ILLUSTRATION OF THE EFFECTS OF HOMEMADE OPTICAL WAVEPLATES

For the purposes of the exploration a series of eight waveplates were constructed by the application of unbranded 1 inch wide clear sticky tape to clean glass microscope slides. Each waveplate comprised a different number of layers in various orientations to each other and were labelled W,+1,+2,+3,+4,+5,+6,+7 as shown in the photo immediately below.

As can be inferred from the title, no attempt will be made to quantify the effects of any of the waveplates used in the exploration, and so no further detailed explanation of the construction of the waveplates will be included here.

All photomicrographs in this exploration were captured using a Brunel Eyecam Plus eyepiece camera fitted to a Vickers M10A microscope dating back to 1985. The microscope was fitted with a polarising filter immediately on top of the condenser and an analysing filter immediately above the objective turret. To enable the interposition of the waveplates between the filters, a glass stage plate was placed on the microscope stage as shown below.

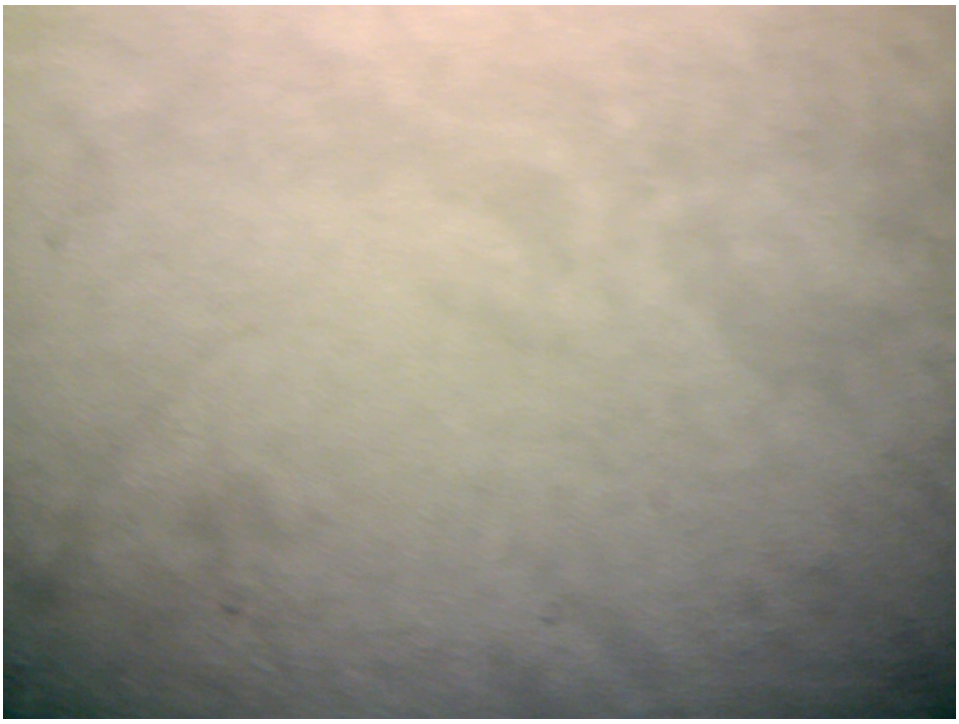


Although no quantitative interpretation of the waveplate effects will be attempted, it is worth seeing what those effects look like without a specimen slide

Crossed polars with no waveplate

Crossed polars with waveplate W

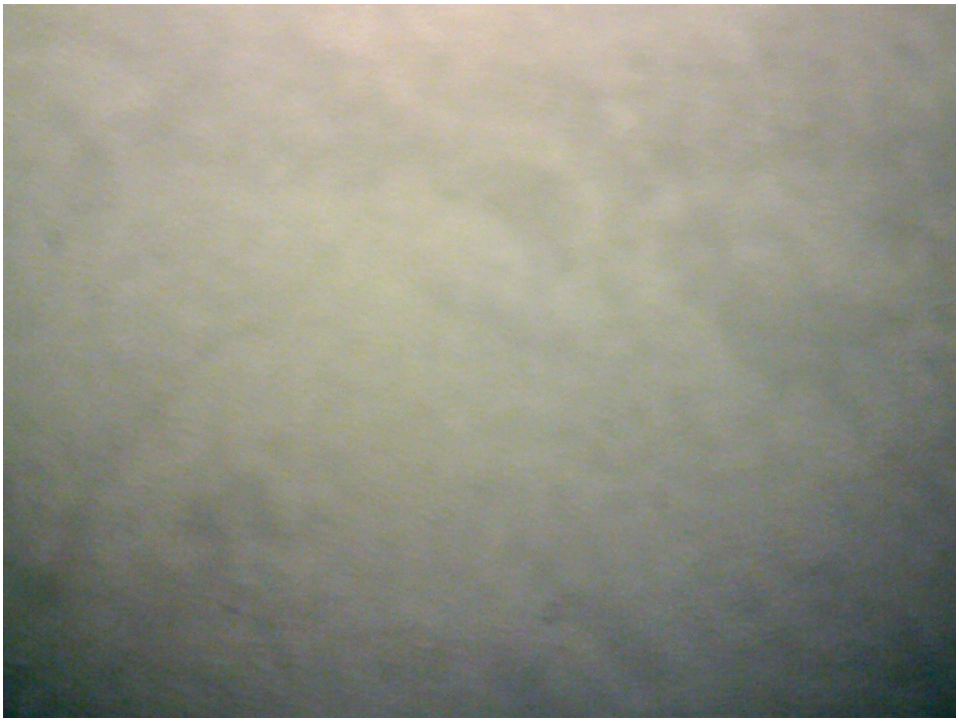
Crossed polars with waveplate +1



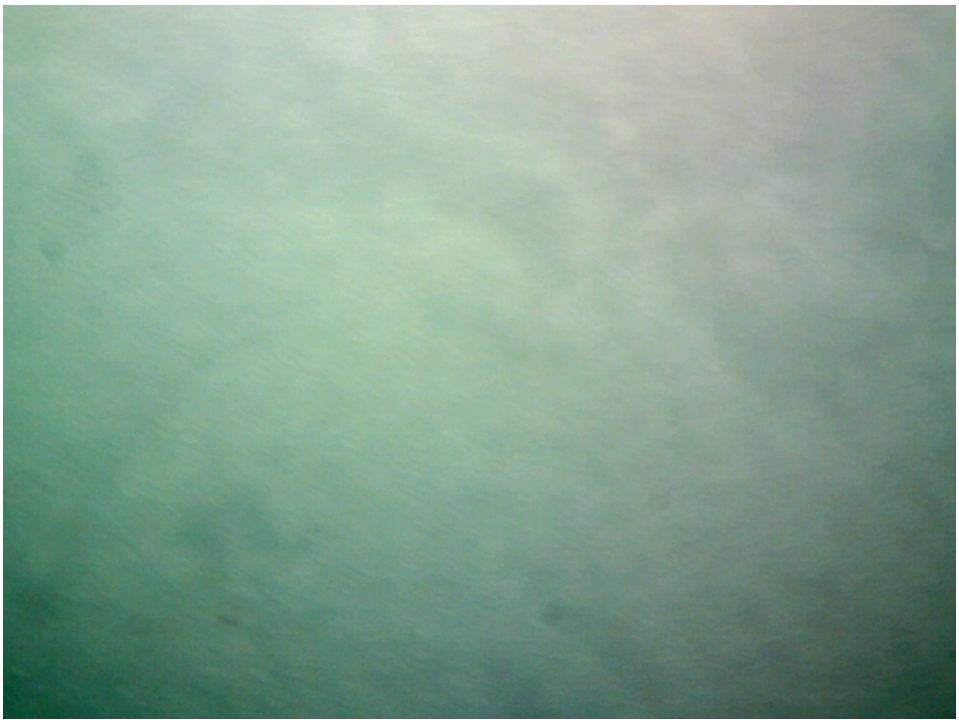
Crossed polars with waveplate +2

Crossed polars with waveplate +3

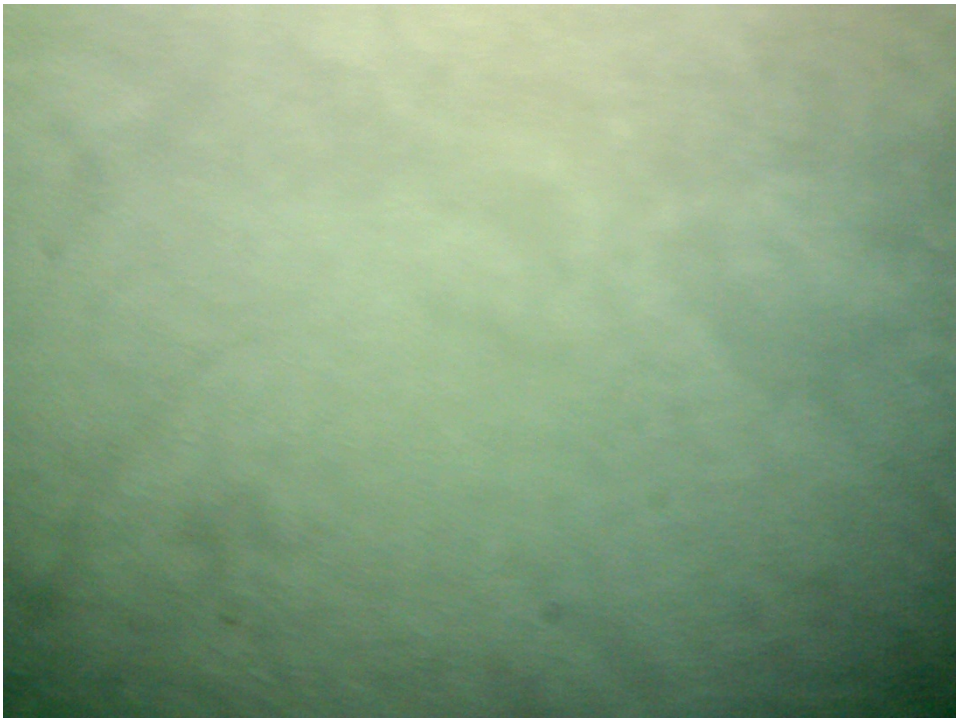
Crossed polars with waveplate +4



Crossed polars with waveplate +5



Crossed polars with waveplate +6



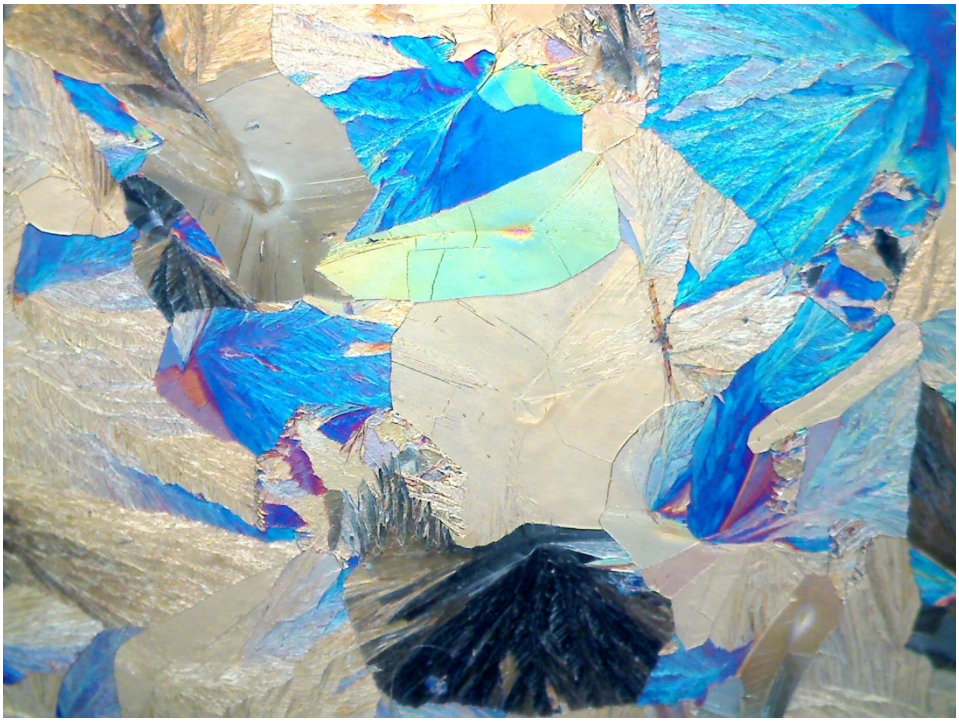
Crossed polars with waveplate +7

Now to introduce a specimen, which for ME23 will be Tartaric acid:

Tartaric acid between crossed polars with no waveplate

Tartaric acid between crossed polars with waveplate W

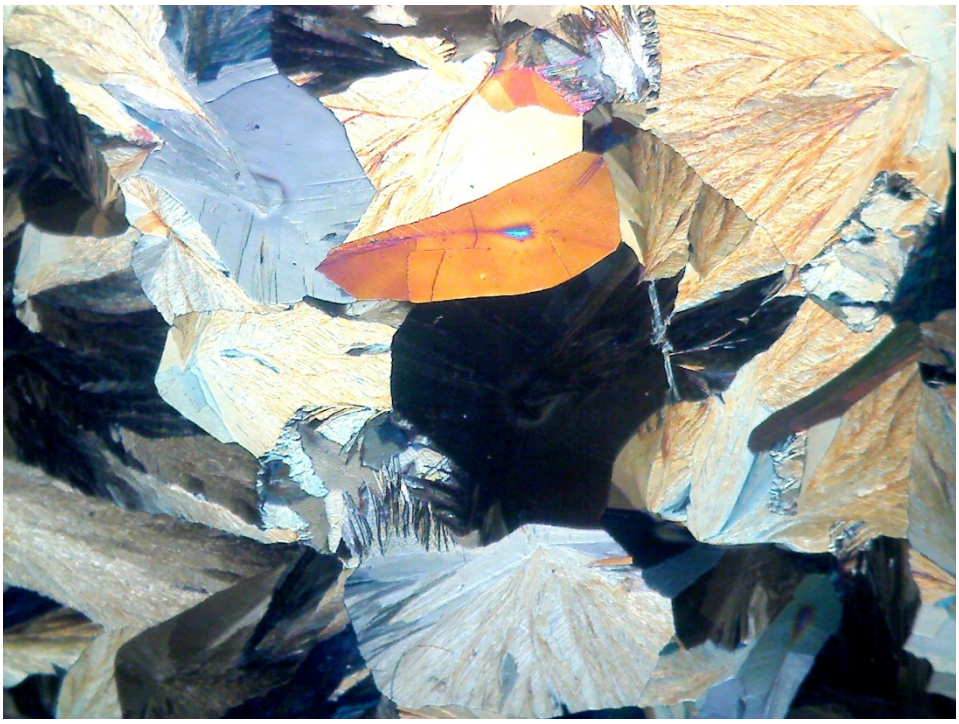
Tartaric acid between crossed polars with waveplate +1



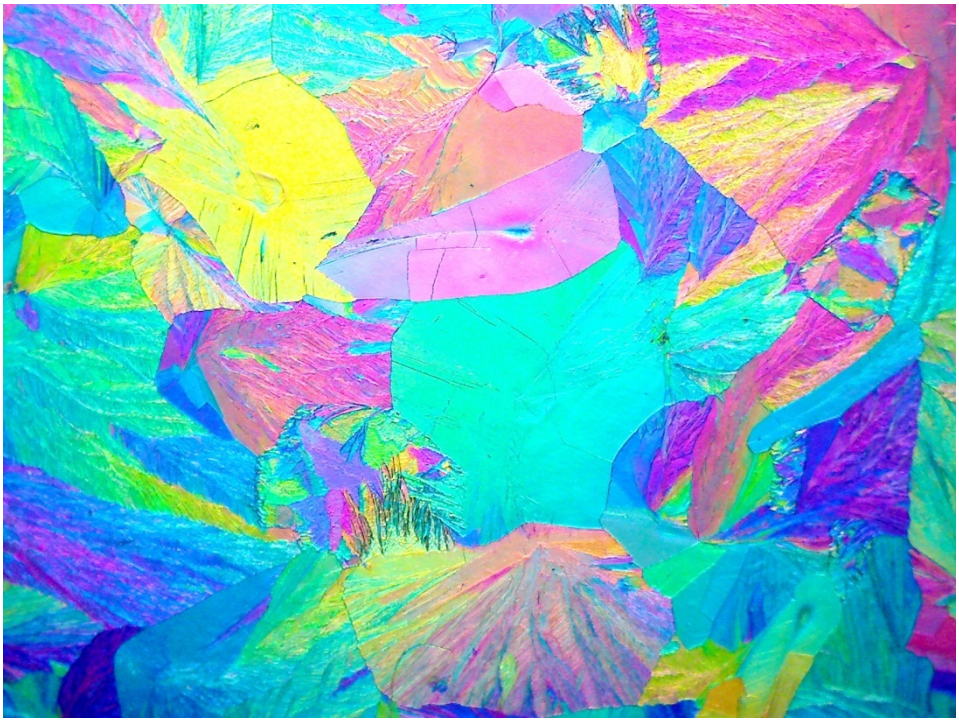
Tartaric acid between crossed polars with waveplate +2

Tartaric acid between crossed polars with waveplate +3

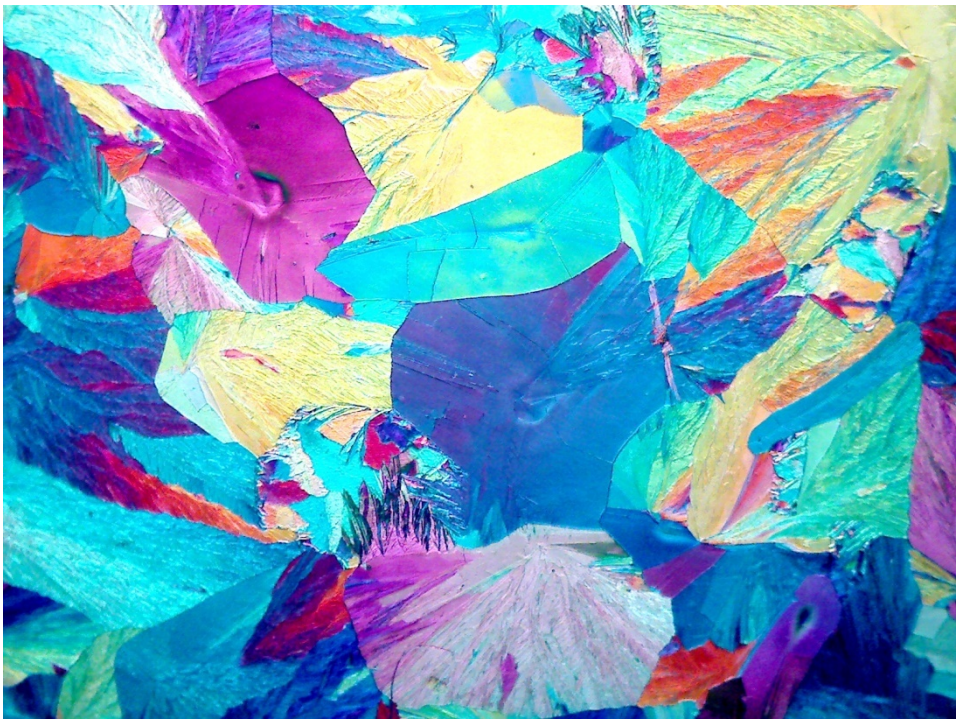
Tartaric acid between crossed polars with waveplate +4



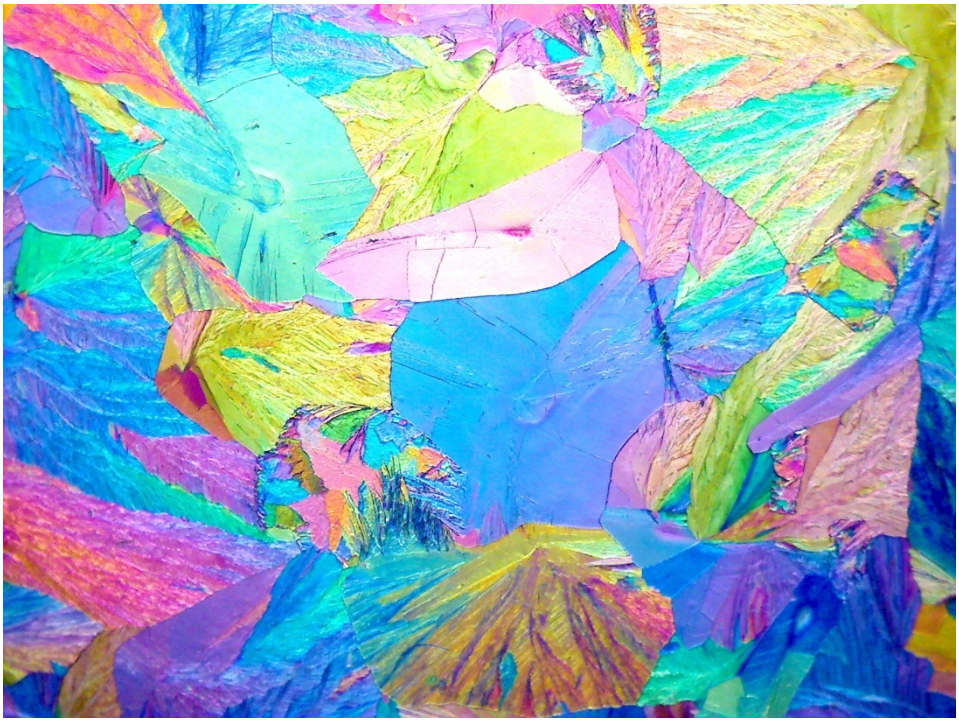
Tartaric acid between crossed polars with waveplate +5



Tartaric acid between crossed polars with waveplate +6



Tartaric acid between crossed polars with waveplate +7



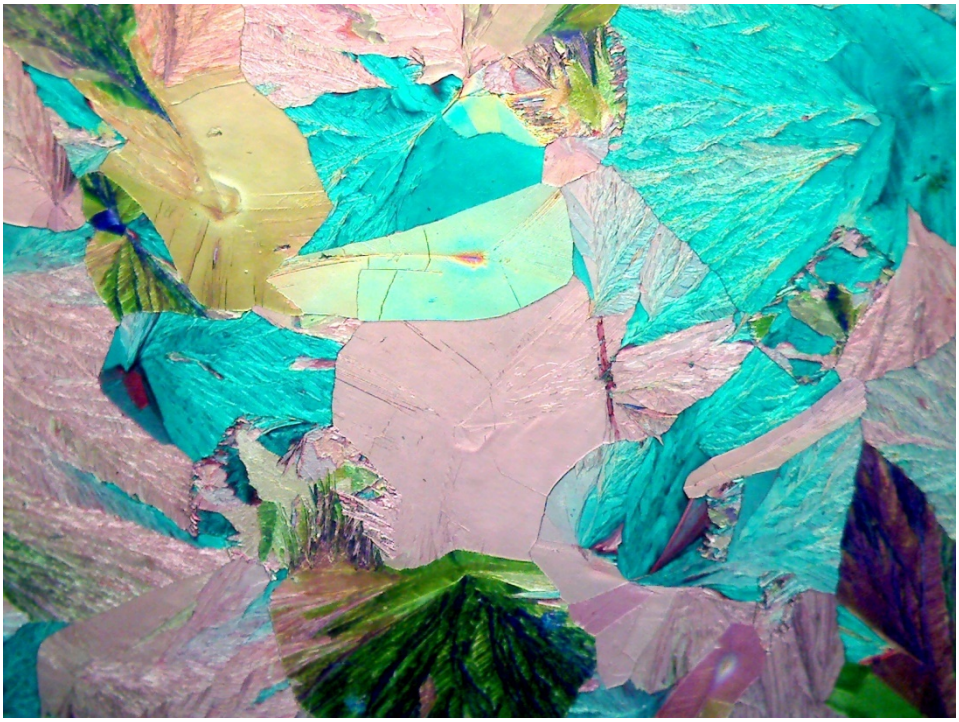
Now to complicate matters somewhat: for the following images the waveplate W will be inserted, with each of the others, in turn, immediately on top of it

Tartaric acid between crossed polars with waveplate W

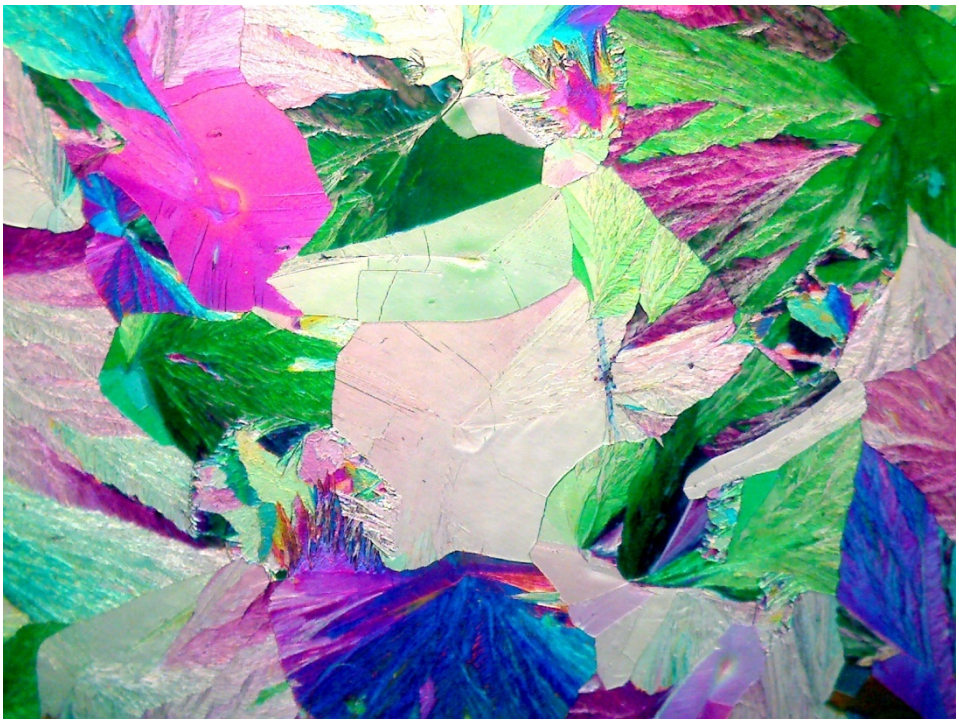
Tartaric acid between crossed polars with waveplate W plus waveplate +1

Tartaric acid between crossed polars with waveplate W plus waveplate +2

Tartaric acid between crossed polars with waveplate W plus waveplate +3

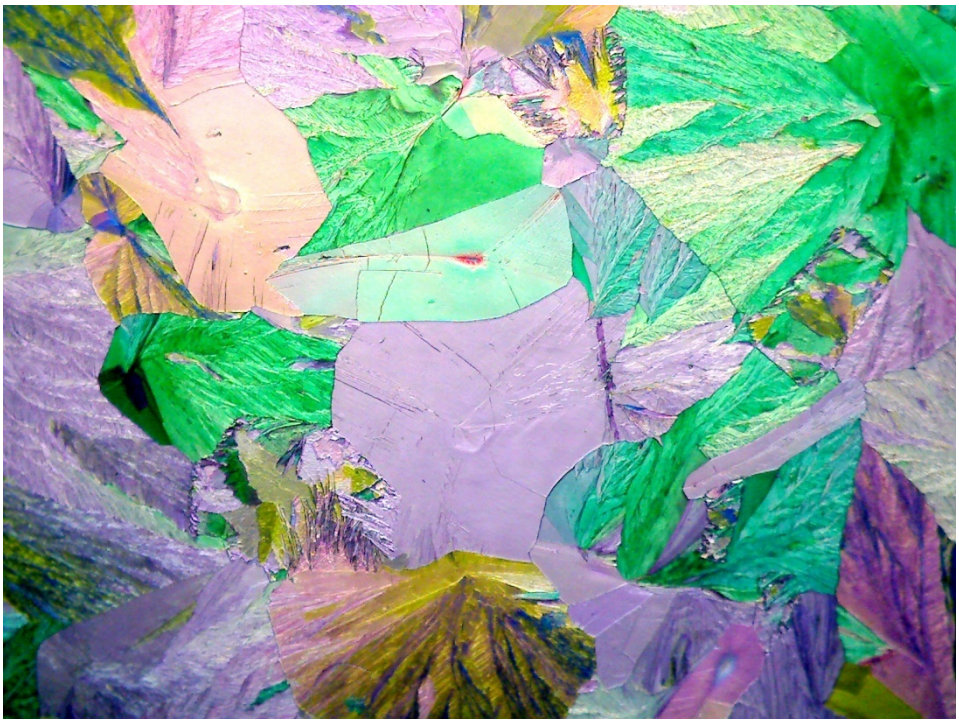


Tartaric acid between crossed polars with waveplate W plus waveplate +4



Tartaric acid between crossed polars with waveplate W plus waveplate +5

Tartaric acid between crossed polars with waveplate W plus waveplate +6



Tartaric acid between crossed polars with waveplate W plus waveplate +7

Now, I could complicate things even further by stacking the waveplates three high, but there are far too many permutations and combinations of those eight for my retired hack chemist's brain to comprehend. So I'll leave things where they are for now and as usual conclude with:

As we say here in Cumbria:

'Ave a go yersel'!

Comments, gratefully received, to:

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