MICROSCOPICAL EXPLORATION

TWENTY FIVE

A New Solvent to try

When I happened to be in my local Pound Stretcher a few days ago, I noticed that '75% Hand Sanitizer' was on sale for 20p per 500ml dispenser, presumably because people are using the stuff less now that the Covid Pandemic is behind us. A closer inspection of the label revealed that the ingredients were Ethanol (75%v/v), Acrylic acid polymers, Trolamine and Water.
Now, to me, the Ethanol would appear to be the active antiseptic ingredient, the Acrylic acid polymers being there to form a gel and the Trolamine to adjust the pH of the product, with Water to make up the volume.

Then came THE BIG QUESTION: Could I use this stuff as a far cheaper alternative to 90% Industrial Methylated Spirit (≈£12 per litre) for dissolution of the chemicals that I investigate during my Microscopical Explorations? The only way to answer the question was to try it. So, I invested a whole Great British Pound and bought five dispensers, ie. 2.5 litres (I could always use it as hand sanitizer (HS from now on) if it was no good for my experiments).

Microscopical Exploration 18 was concerned with fruit acids dissolved in IMS/Acetone, and so I decided to repeat that exploration using the HS as the solvent.

To that end, 8mls of the HS were put into a small lidded glass jar and 2mls of industrial methylated spirit were added with stirring. This had the effect of breaking the gel and reducing the viscosity of the HS and, also, of increasing the proportion of ethanol in the mixture to approximately

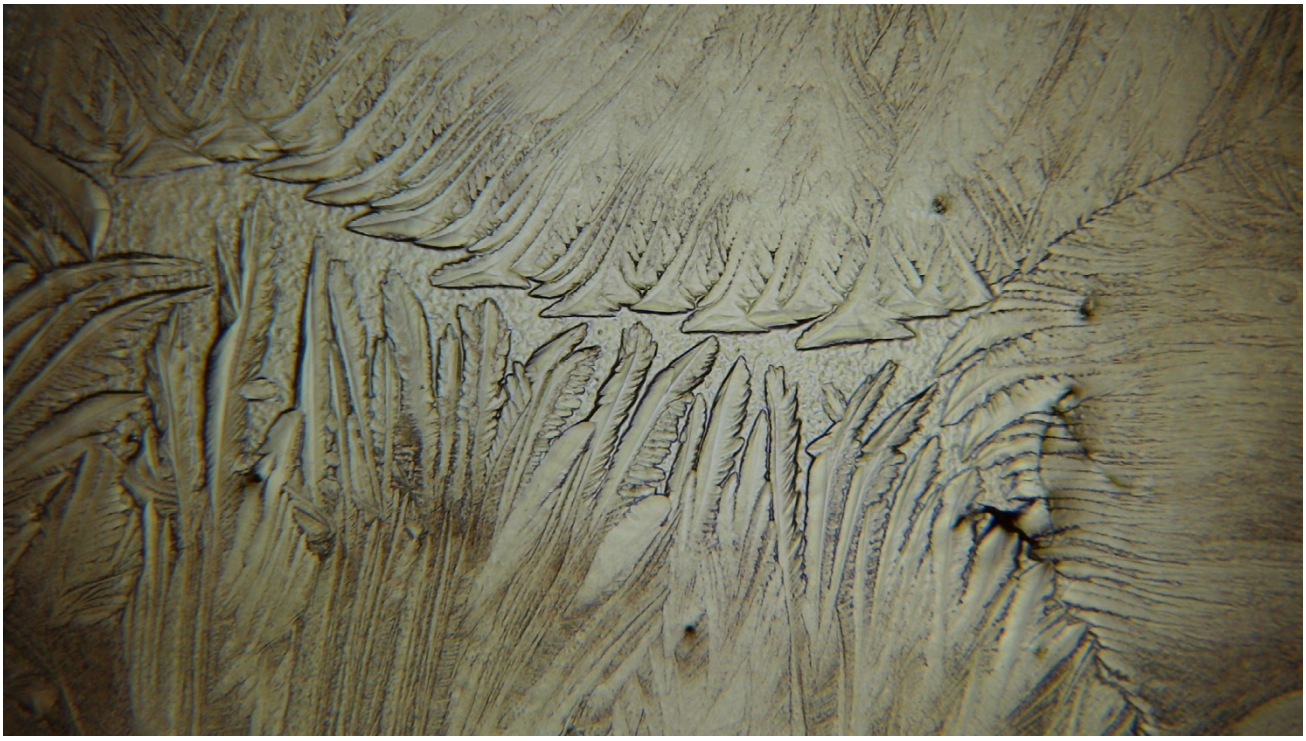
80%v/v. To this liquid was added 0.5 grams of pure citric acid, again with stirring, yielding a solution of citric acid at a concentration of 50mg/ml.

The above procedure was repeated for the other two fruit acids, Malic acid and Tartaric acid.

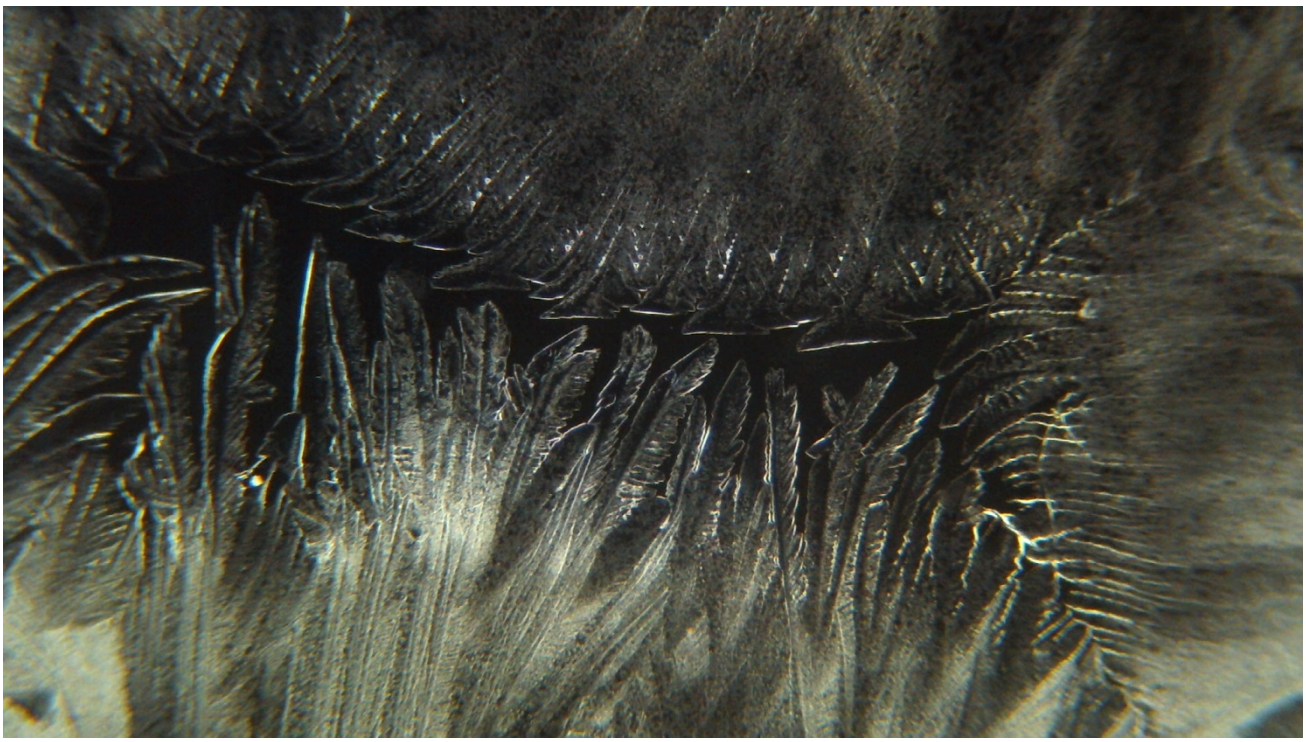
0.2mls of each of the fruit acid solutions was pipetted onto separate clean microscope slides and allowed to crystallize at an ambient temperature of 21°C. The evaporation of the solvent and crystallization of the solute took longer than it did in ME18, probably due to the presence of the acrylic acid polymers in the solvent reducing its volatility.

Each of the slides was observed microscopically and yielded the images shown below:

Citric acid with bright field illumination



Citric acid with dark field illumination



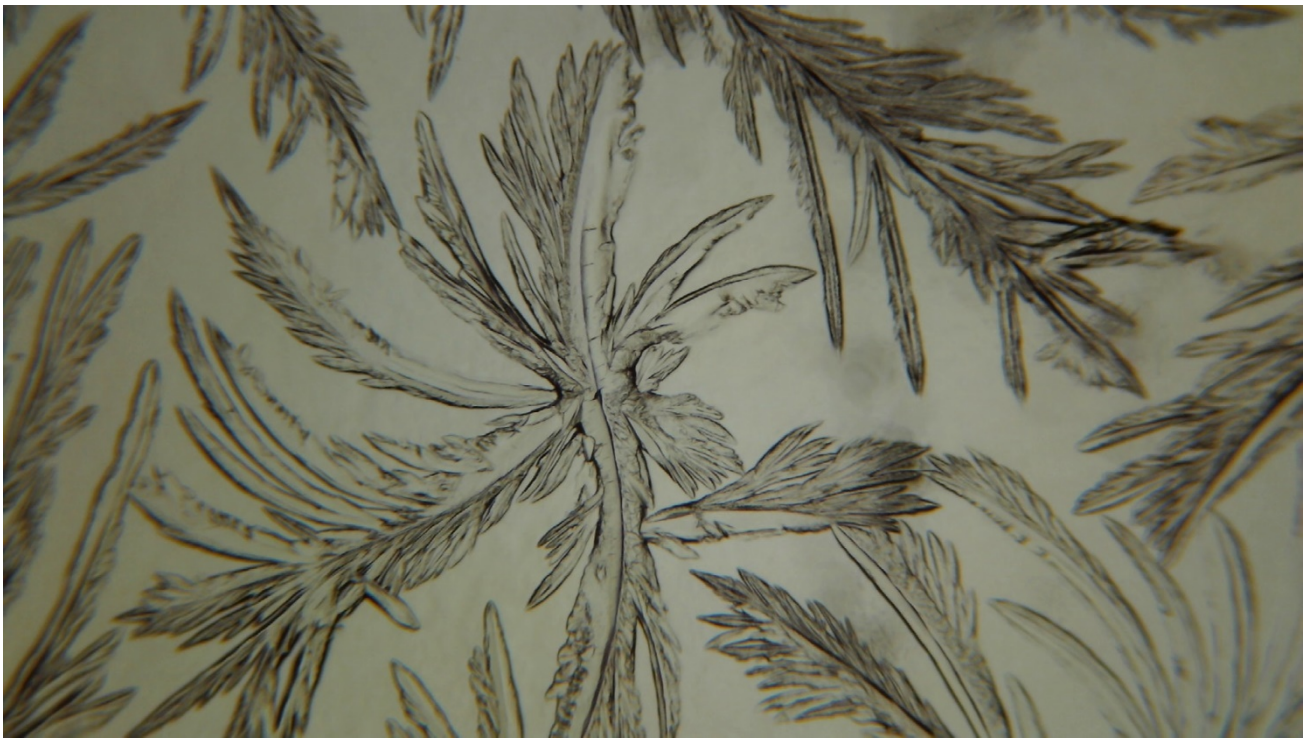
Citric acid between crossed polars

Citric acid between parallel polars

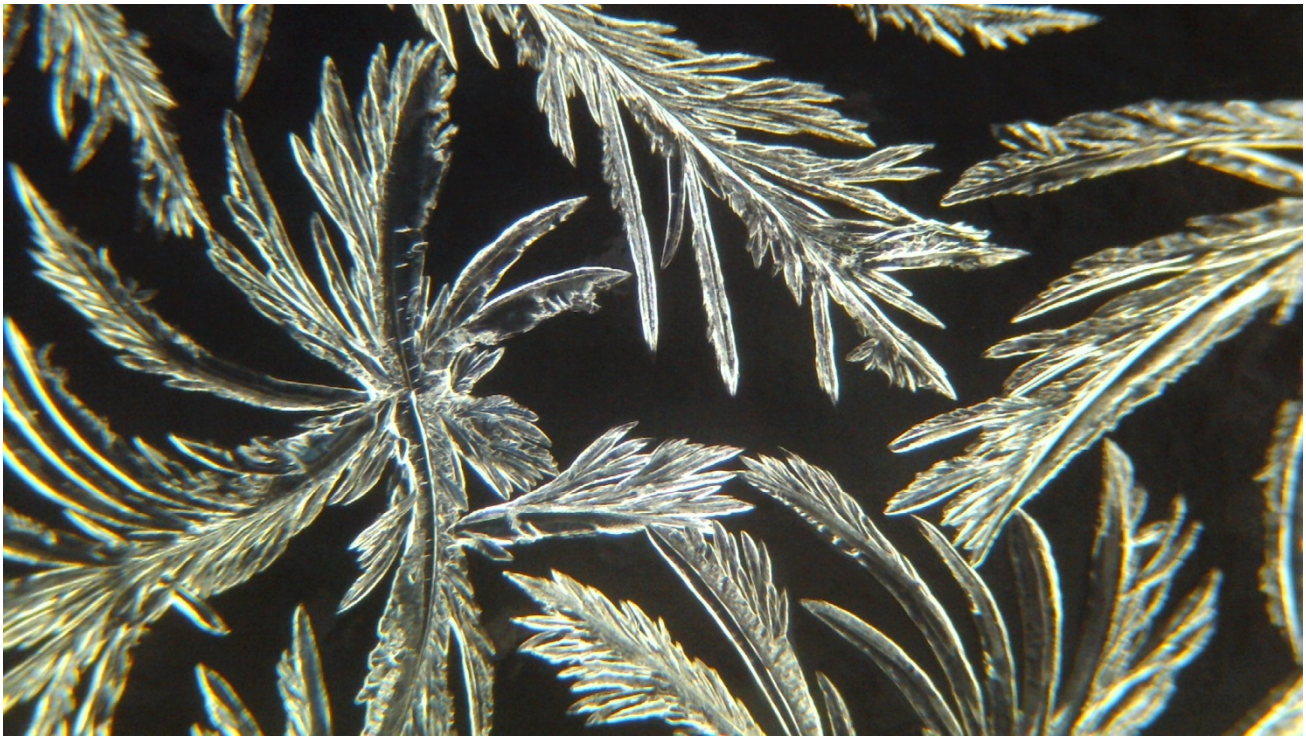
Citric acid between crossed polars plus waveplate

Citric acid between parallel polars plus waveplate

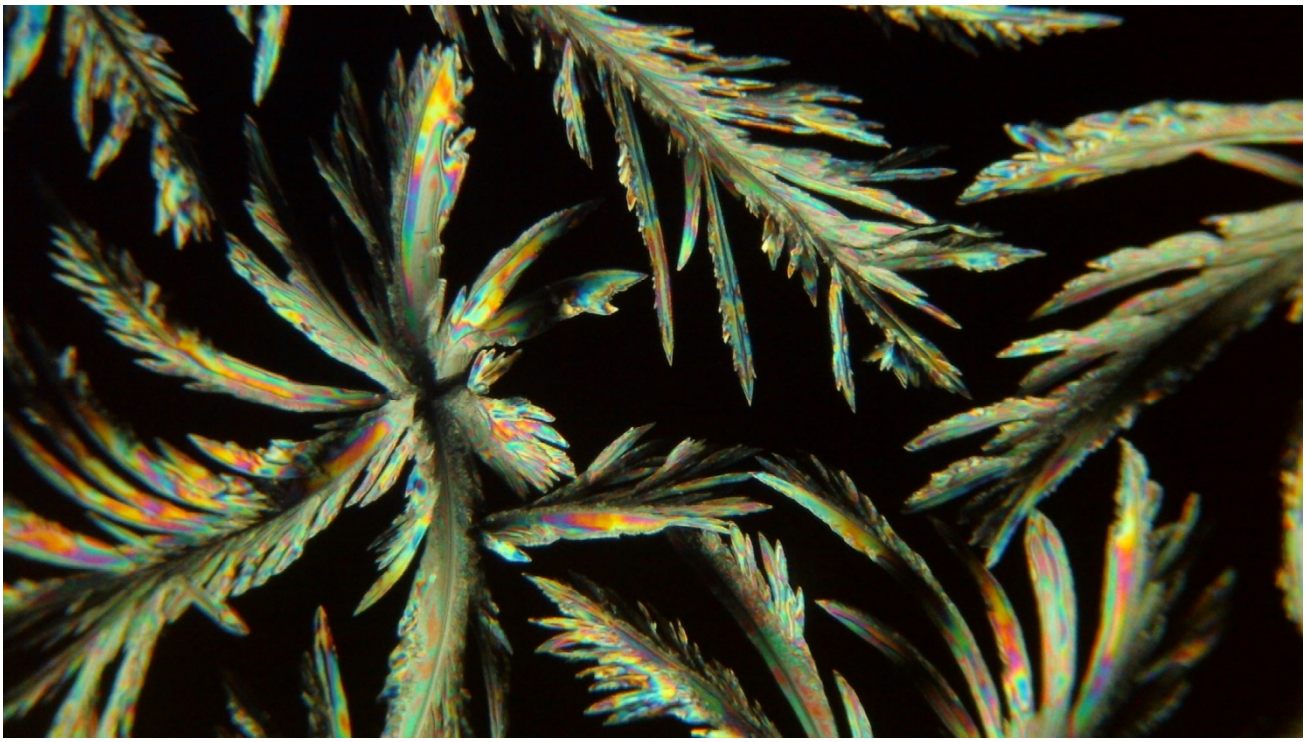
Malic acid with bright field illumination



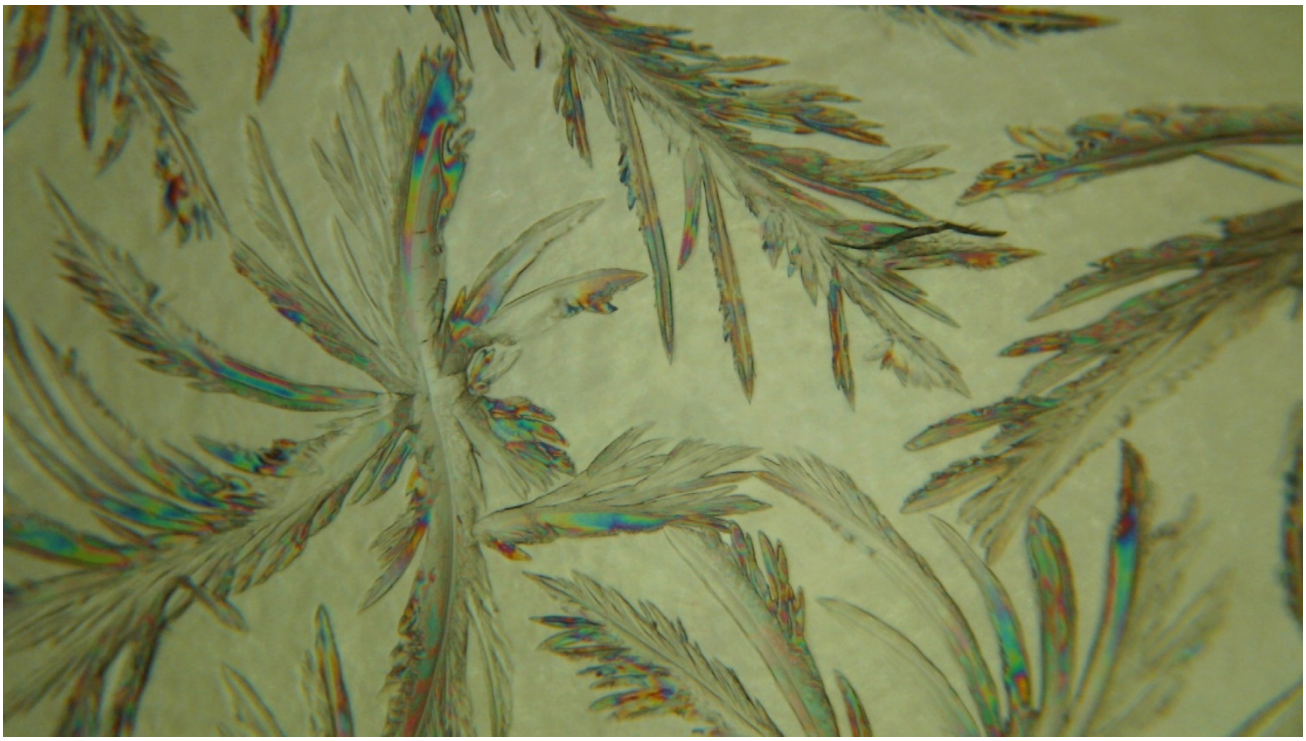
Malic acid with dark field illumination



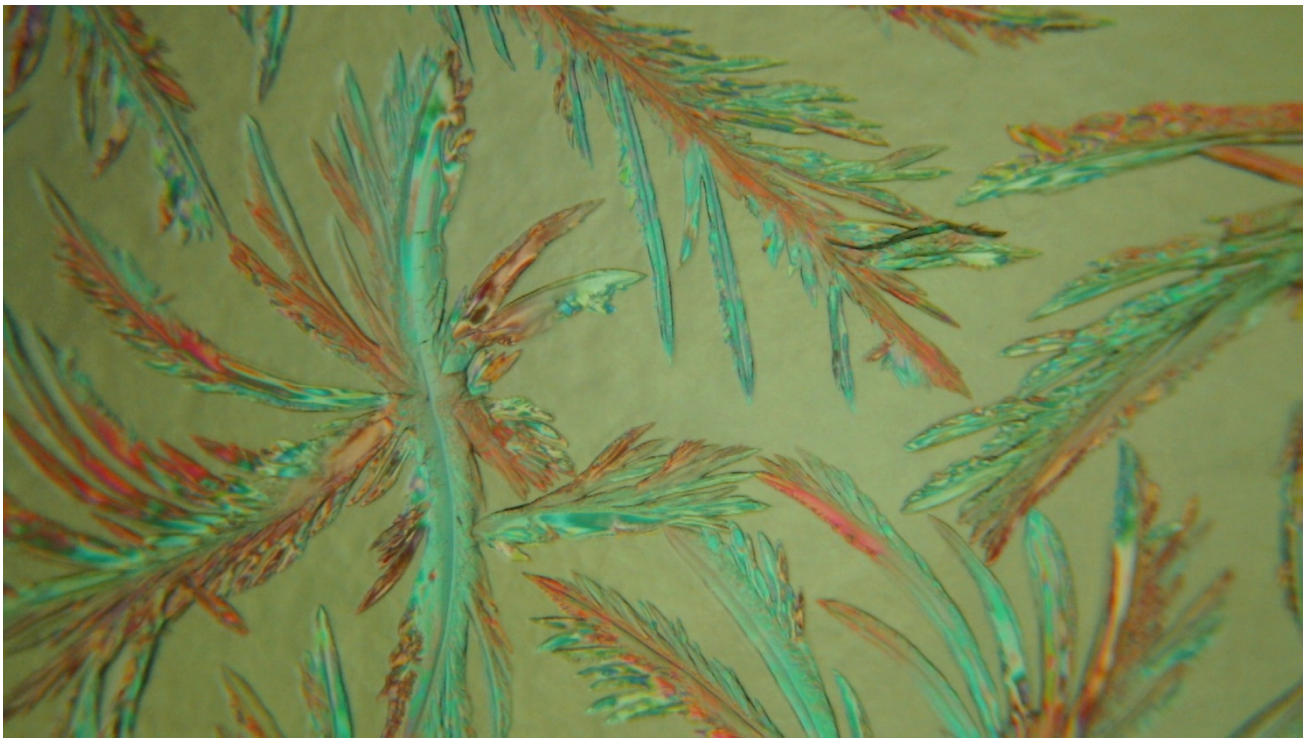
Malic acid between crossed polars



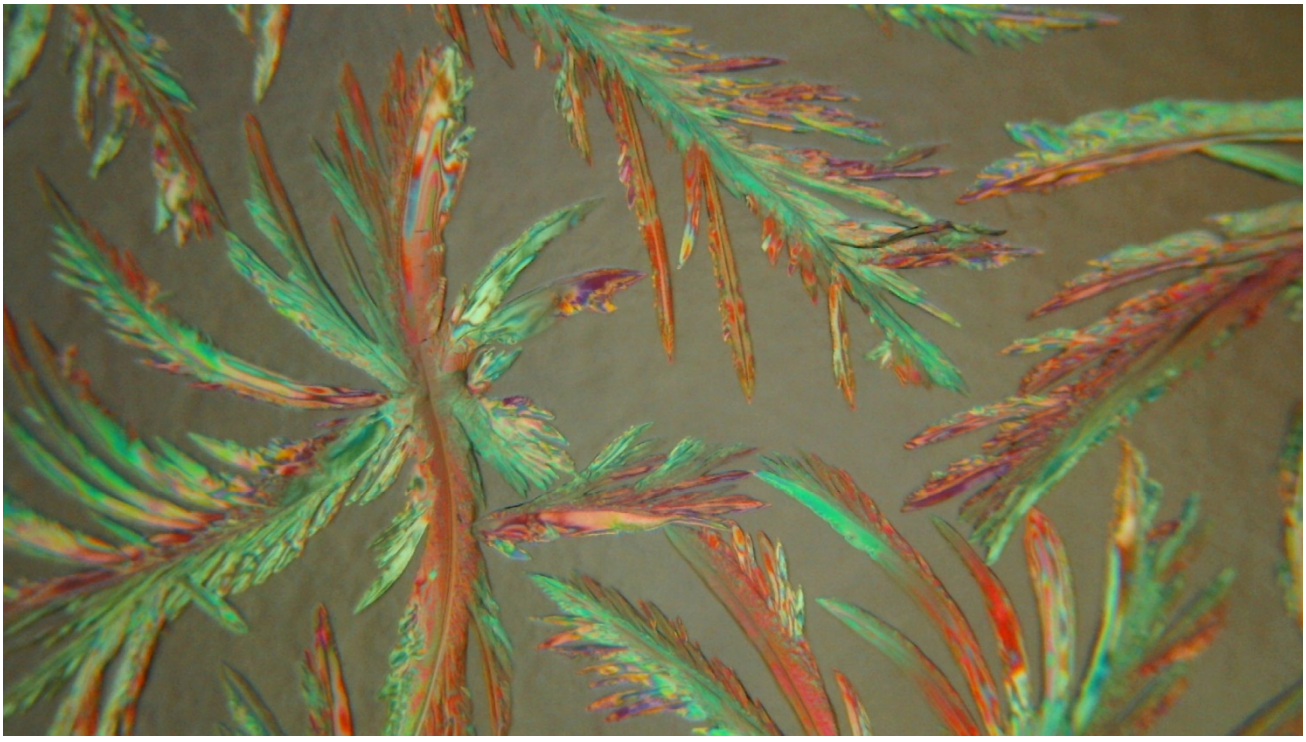
Malic acid between parallel polars



Malic acid between crossed polars plus waveplate

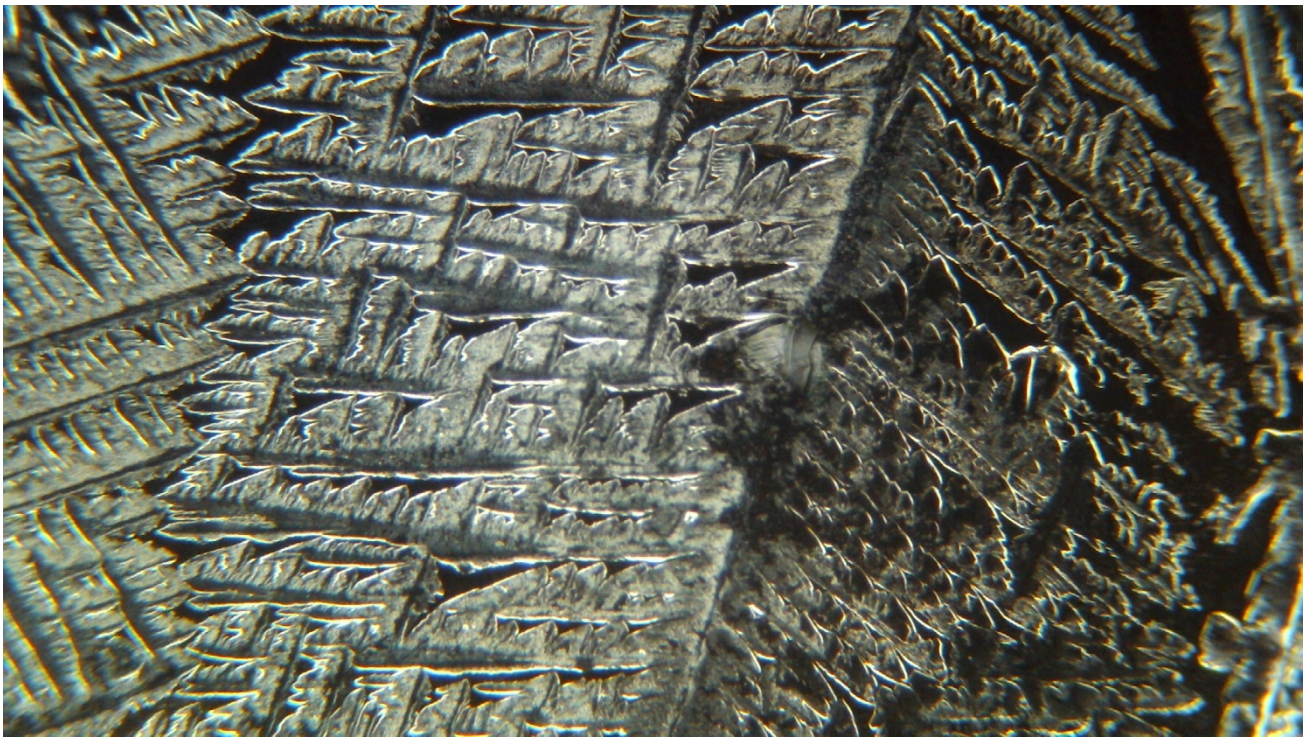


Malic acid between parallel polars plus waveplate

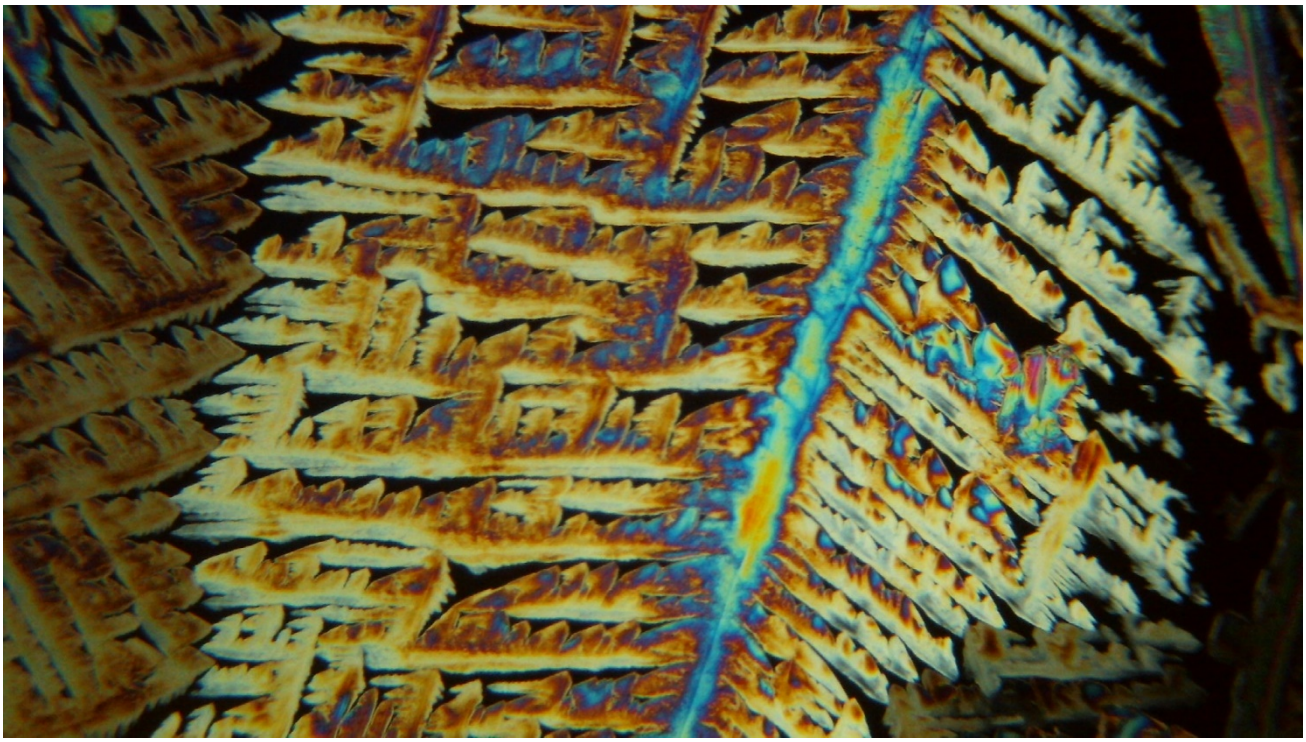


Tartaric acid with bright field illumination

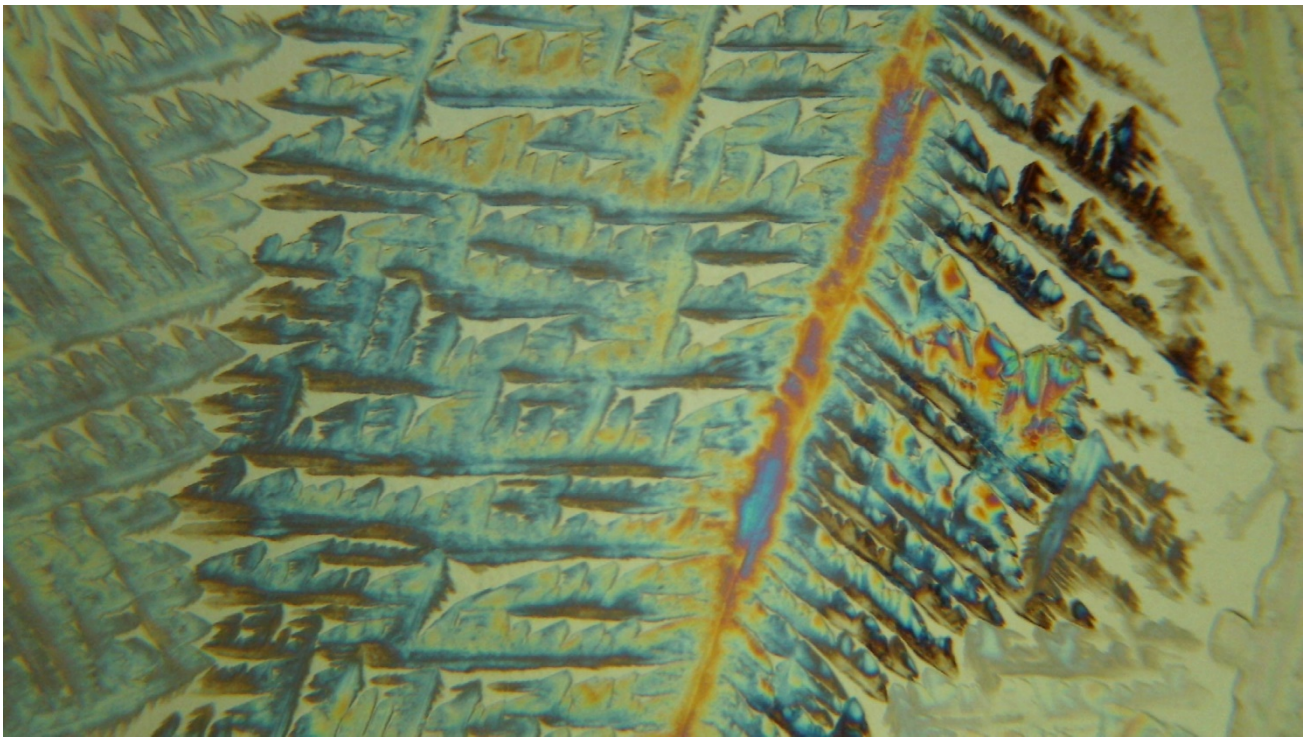
Tartaric acid with dark field illumination



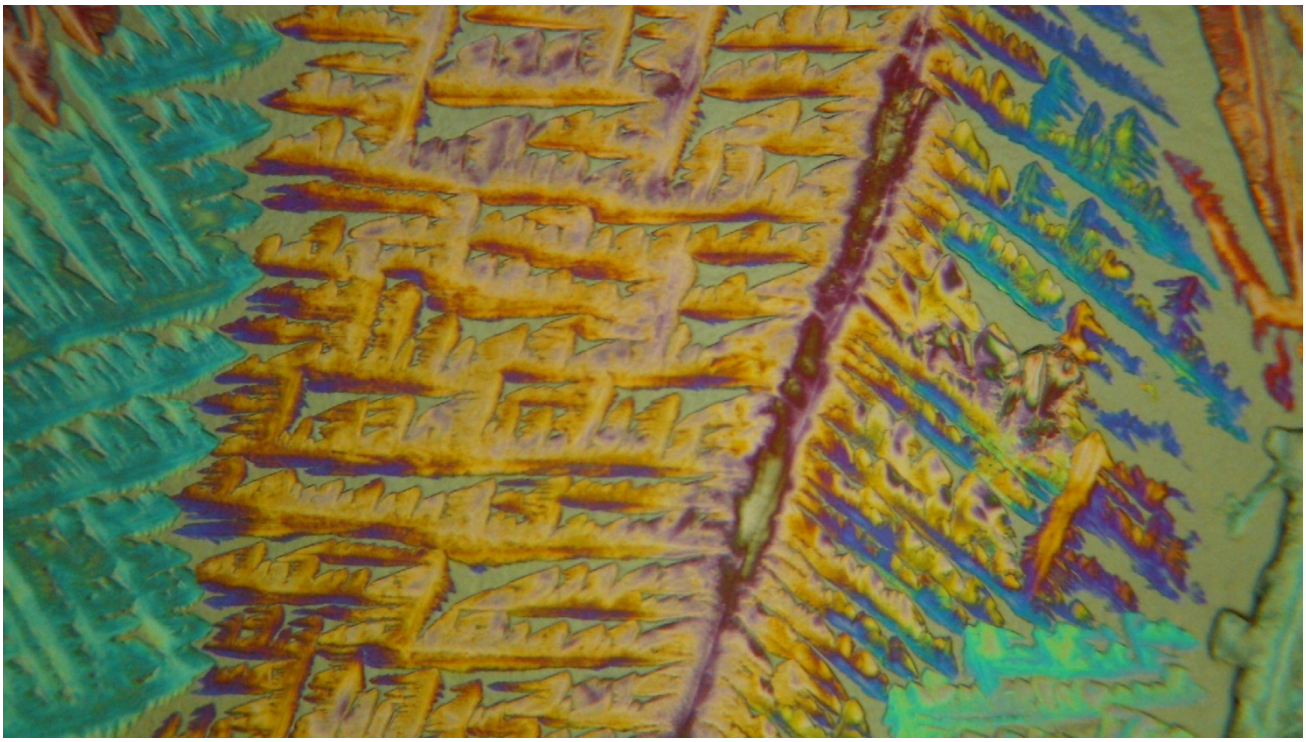
Tartaric acid between crossed polars



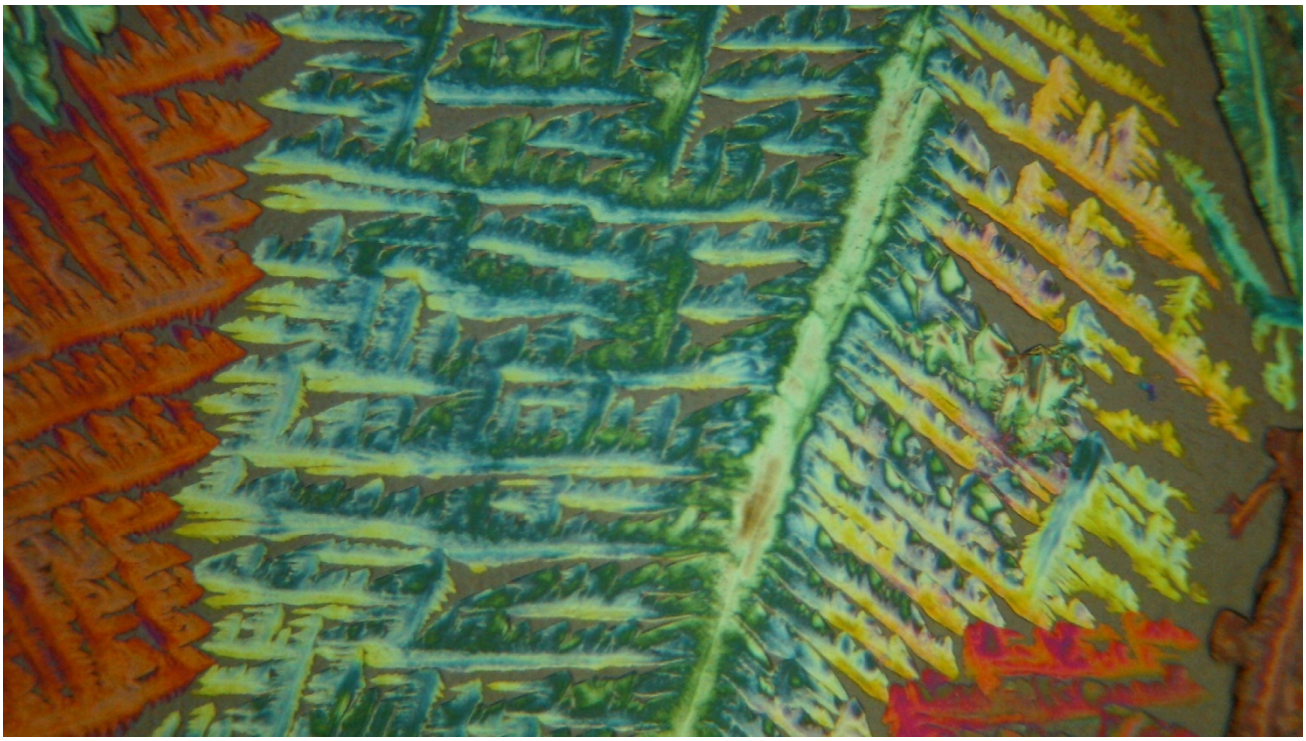
Tartaric acid between parallel polars



Tartaric acid between crossed polars plus waveplate



Tartaric acid between parallel polars plus waveplate



In Conclusion

The images above confirm the suitability of the HS as a solvent for the organic compounds used in this Microscopical Exploration and I will use HS as such in future explorations as appropriate.

As we say here in Cumbria:

‘Ave a go yersel’!

Comments, gratefully received, to:

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