MICROSCOPICAL EXPLORATION SEVEN

MEDICINE CABINET AND KITCHEN CUPBOARD

Or

Paracetamol, meet Washing Powder

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Having enjoyed some success exploring the contents of both medicine cabinet and cleaning cupboard separately, could I combine something from each in a mixture worthy of observation?
The same microscope setup as I used in my previous explorations was ready and waiting, but I also have a new 'bit of kit', a hand held note checker UV light, which I need to bring into service.
So, having done the Risk Assessment and having obtained the Permit to Proceed I took a look in the cleaning cupboard. The first thing I noticed was a large box of washing powder, in this case DAZ, (others washing powders are available). Now, washing powders usually contain stuff called optical brightener which enhances the colour of your clothes. They work by absorbing ultra violet and violet light and re-emitting blue light by fluorescence. Here, I thought is an opportunity to do something useful with my new UV lamp.

THE TEST SOLUTION

For this exploration I decided to use a solvent mixture comprising ethyl acetate and acetone in equal proportions.
i) Thirty millilitres of the solvent mixture were placed in a lidded glass jar and the contents of two 500mg Paracetamol capsules were added.
ii) A settled volume of approximately 5 millilitres of washing powder were then added to the jar.
iii) The jar lid was then securely attached and the jar contents were thoroughly mixed by shaking.
iv) The resulting solution was then clarified by filtration through coffee filter paper.

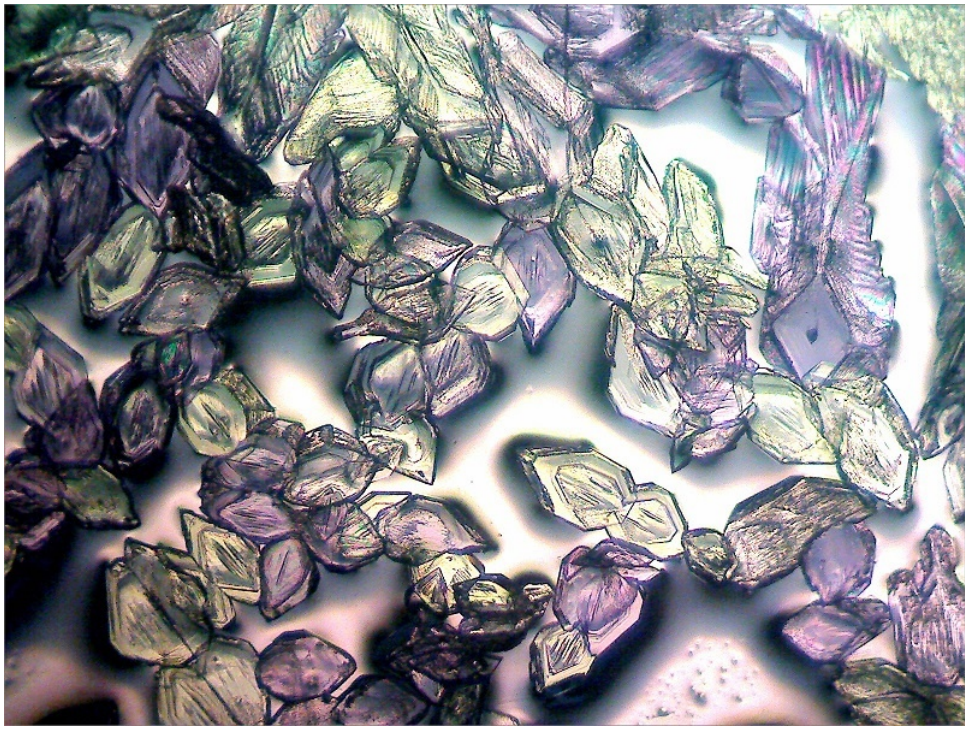
THE SPECIMEN SLIDE

A specimen slide was prepared by applying 5 drops (approximately 0.25 millilitres) of the test solution to a clean glass microscope slide and allowing the solvent to evaporate at ambient room temperature.
The specimen slide was observed between crossed polars using incandescent sub-stage illumination by placing it transversely on top of the glass stage plate of my Vickers M10A with the polariser and analyser arranged as in previous Microscopical Explorations. A series of images, PARADAZ 1-7,as shown below, were captured using MycoCam5 image capture software. Each of the seven images was duplicated with the sub-stage illumination switched off and the slide, instead, illuminated from above by ultra-violet light at 395nm from a hand held UV lamp. These are shown below as PARADAZ 1UV-7UV

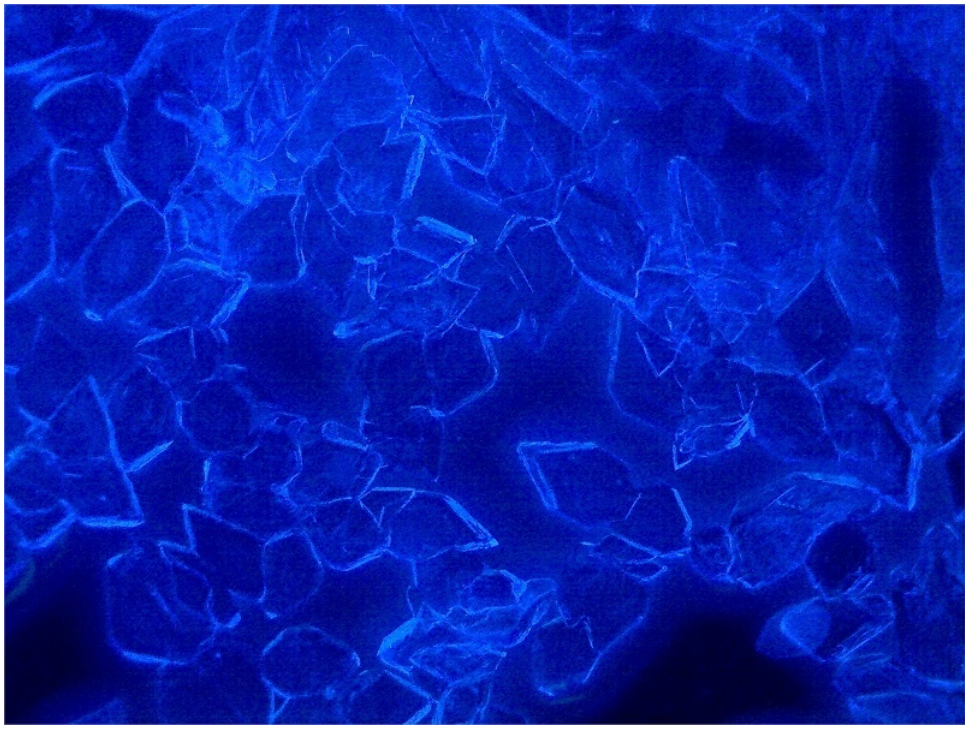
THE IMAGES

The following images were captured using a Prior x2.7 objective lens.

PARADAZ 1

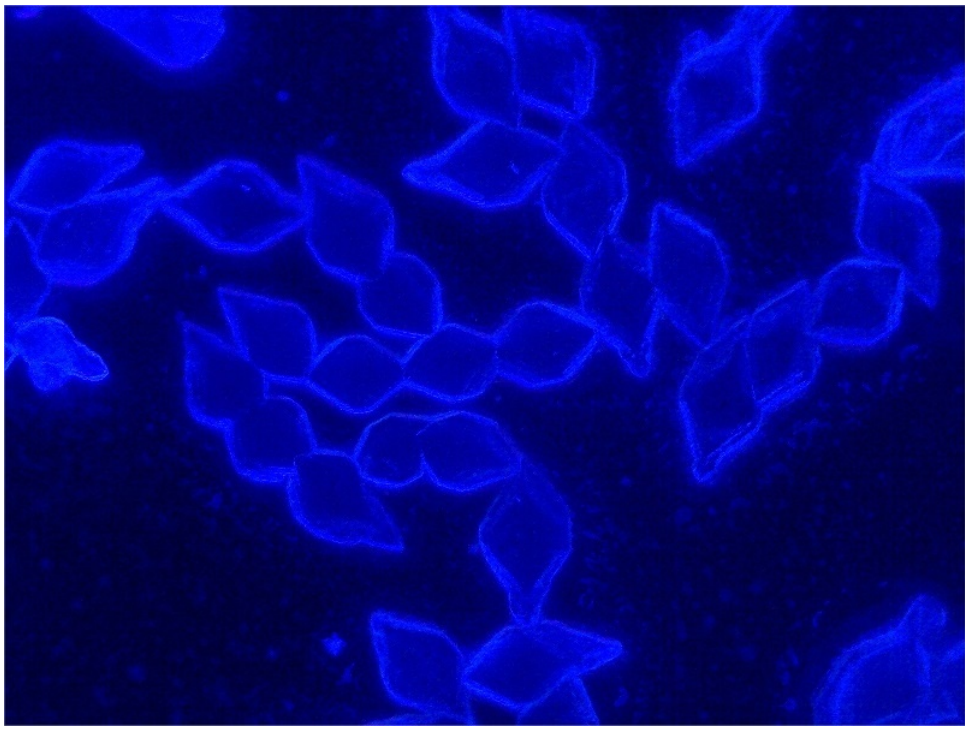


PARADAZ 1UV

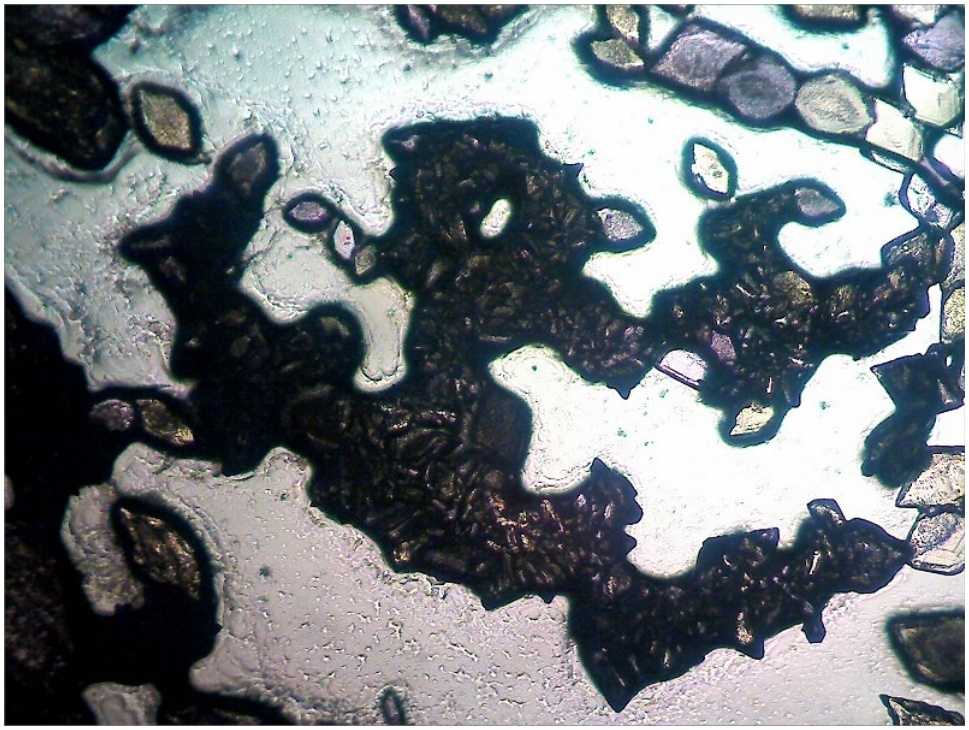


PARADAZ 2

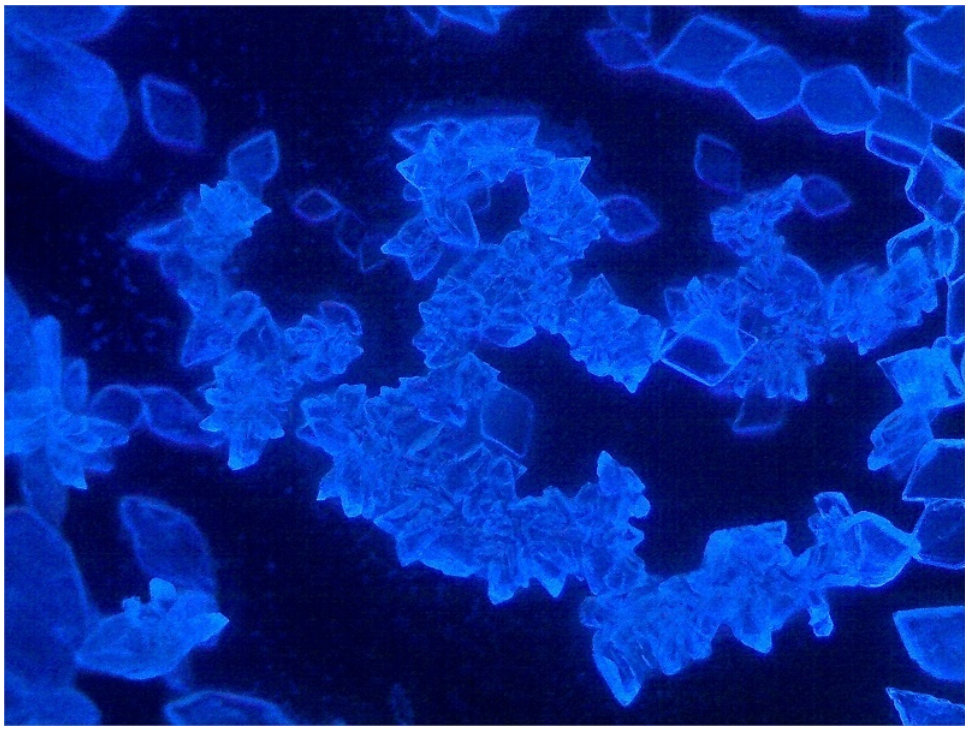
PARADAZ 2UV



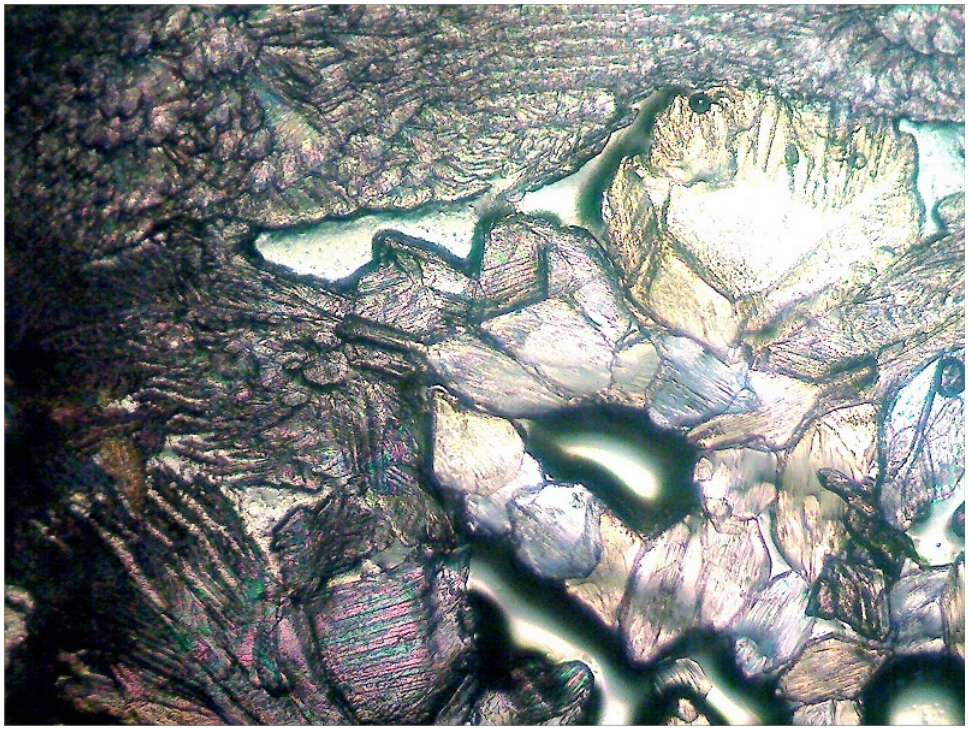
PARADAZ 3



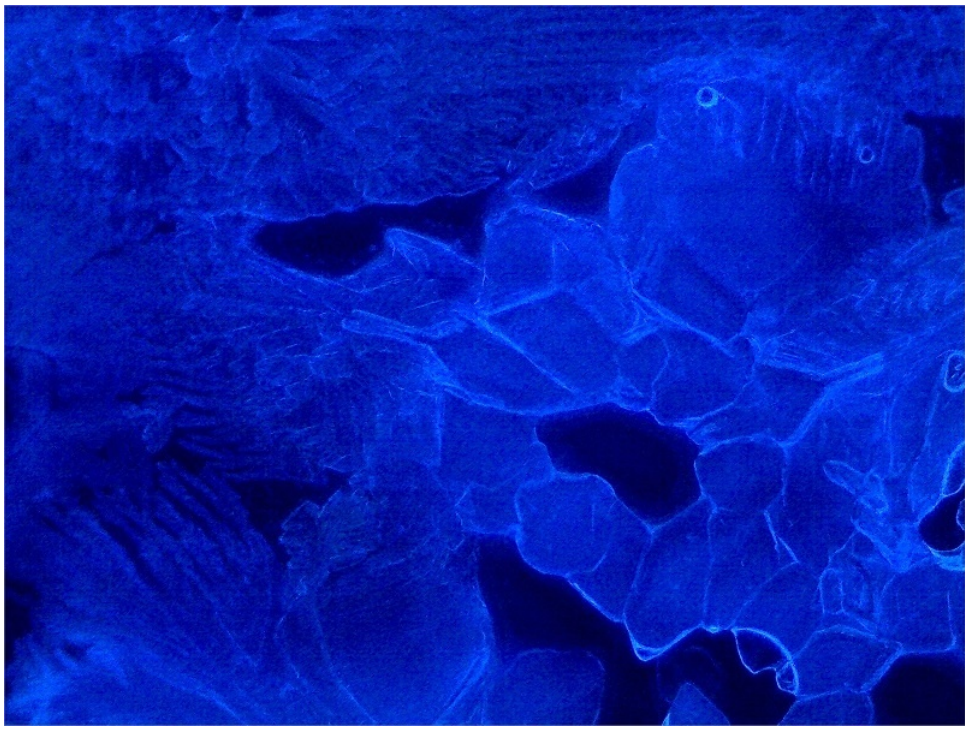
PARADAZ 3UV



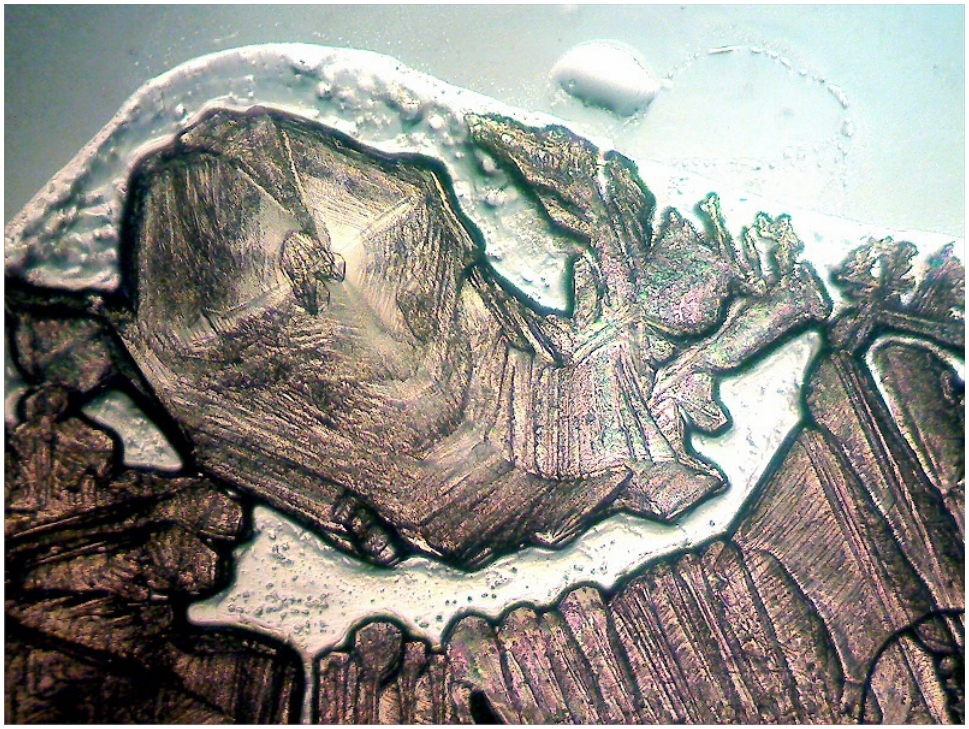
PARADAZ 4



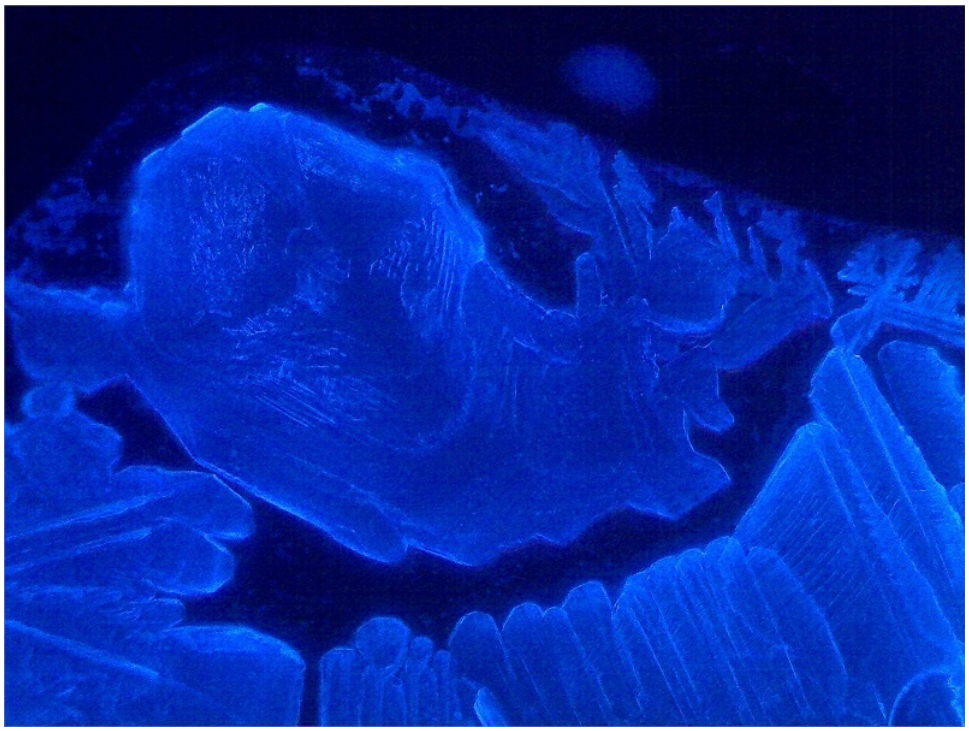
PARADAZ 4UV



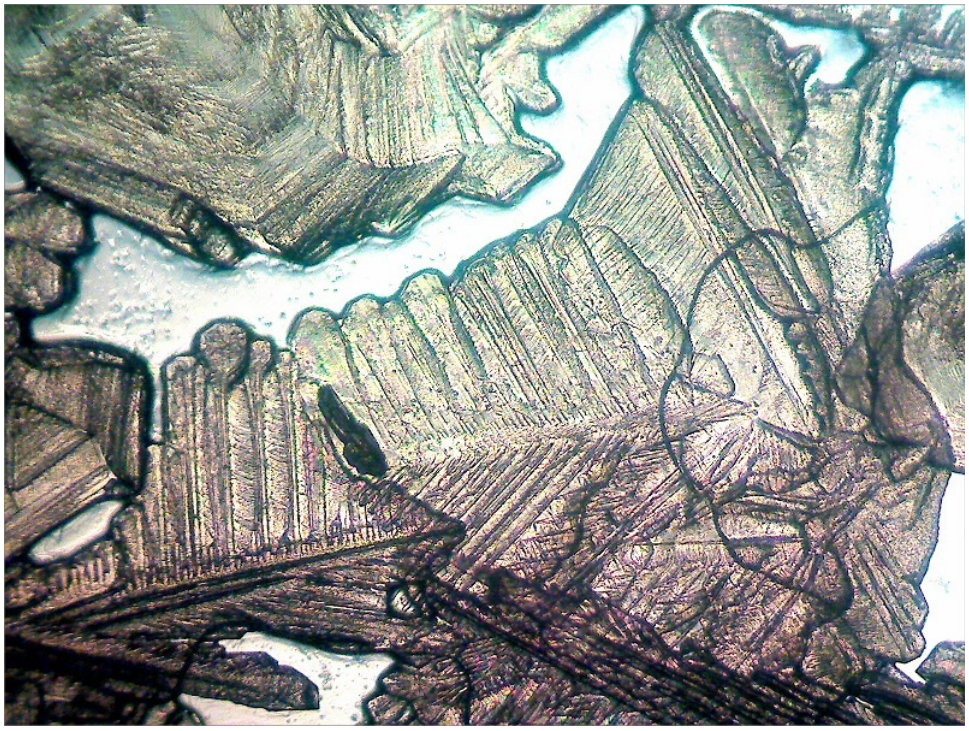
PARADAZ 5



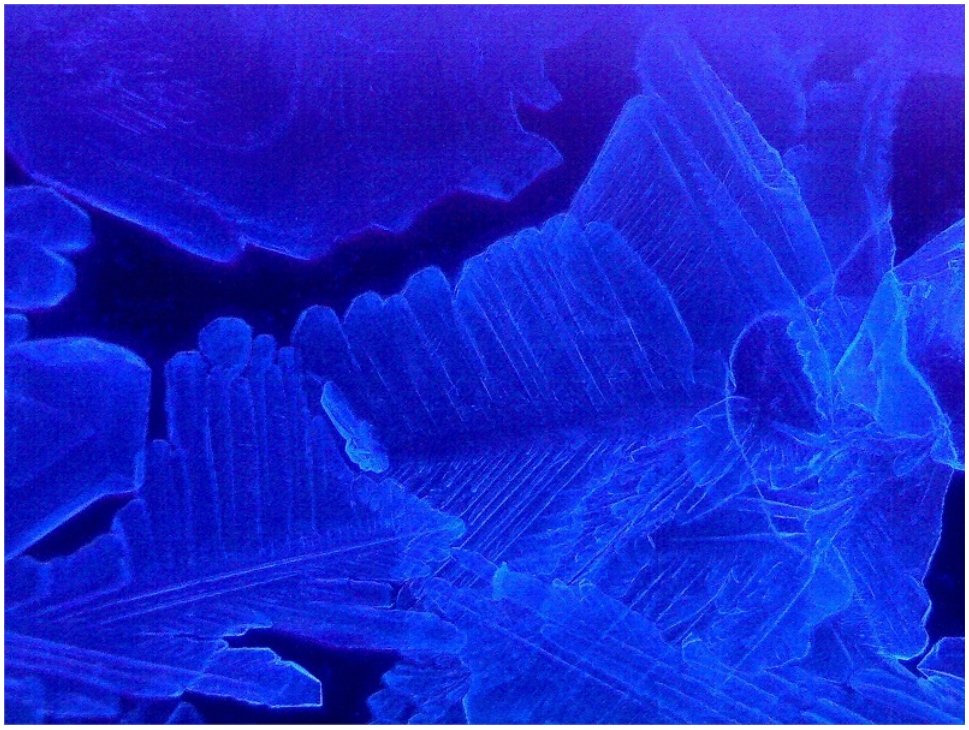
PARADAZ 5UV



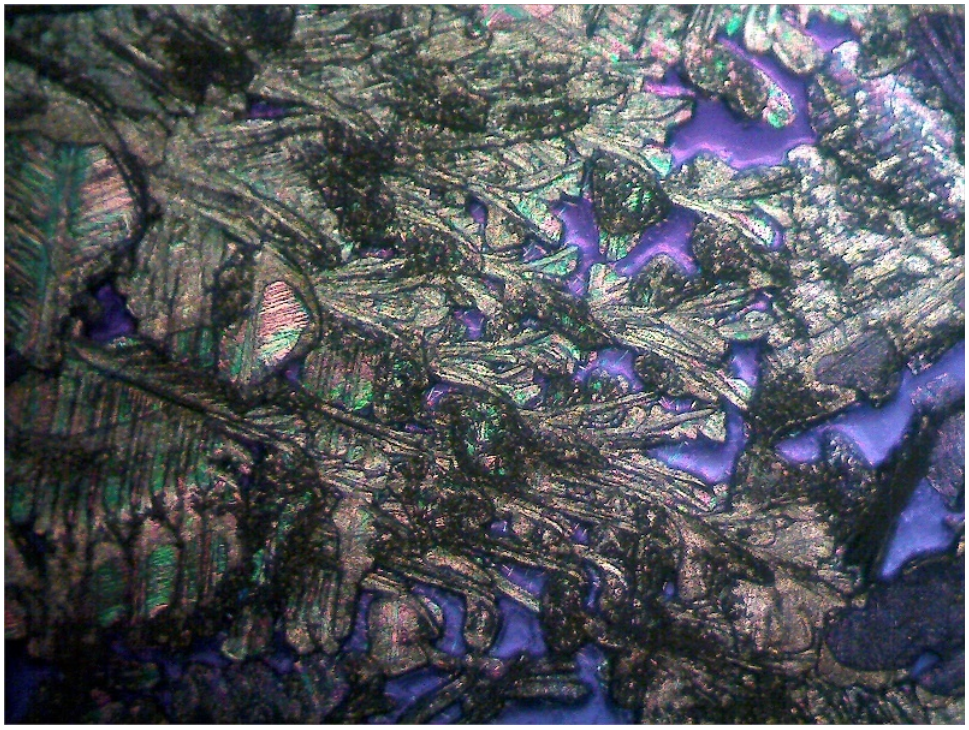
PARADAZ 6



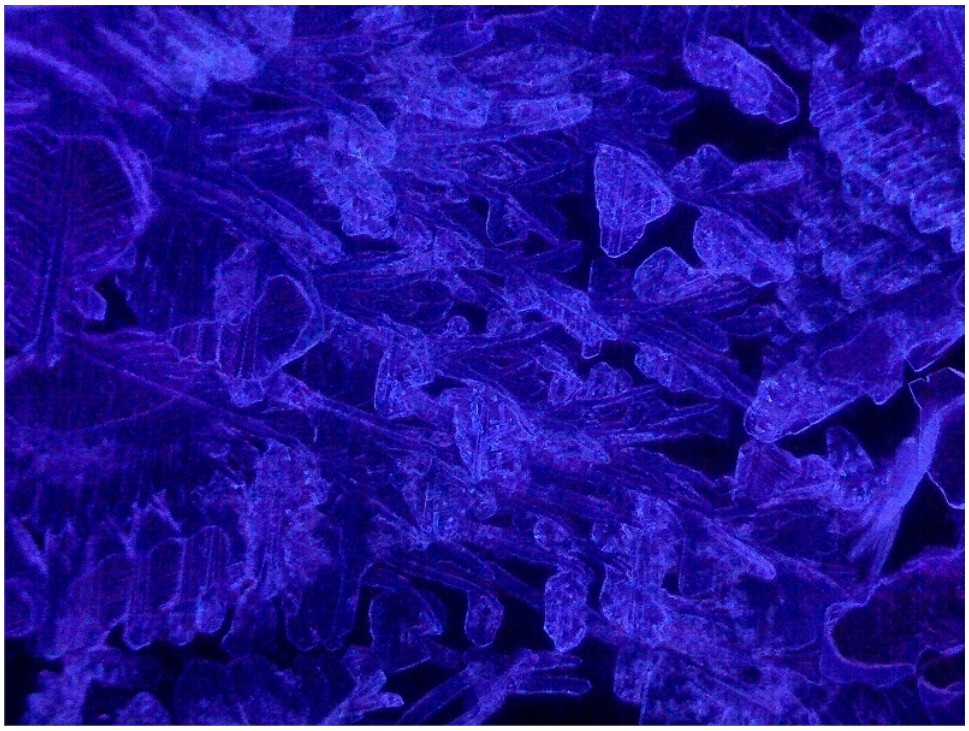
PARADAZ 6UV



PARADAZ 7



PARADAZ 7UV



IN CONCLUSION

Paracetamol does not possess particularly strong native fluorescence and I suspect that the optical brightener from the washing powder might have somehow bonded with or coated the paracetamol crystals.
Thus, the fluorescence induced by illumination with UV light brings out the morphological detail differently to that shown using visible light in the crystals formed on the specimen slide.

As before, interpret these images as you will, but as we say here in Cumbria:

‘Ave a go yersel’!

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