

so dense and opaque to light that ten vols. of spirit would be necessary to show its beautiful spectrum to the greatest advantage. As the dilution proceeds, the finest and faintest lines disappear, and afterwards the darkest. A few trials will soon point out the most effective strength to be employed.

The advantage arising from the use of the wedge-shaped cells is now apparent, because by rising or lowering the stage of the microscope, a thicker or thinner stratum of the solution may be viewed.

The constancy of the spectra is very great if only ordinary care and a good spectrocope be used. When a microscopist has once found out the most comfortable and advantageous position of his instrument and illuminating apparatus, he had better always use the same. I always prefer a paraffin lamp mounted on a sliding stand, which I place to the right of my microscope, and have the red end of the spectrum to the left, simply because, from force of habit, it seems to suit my spectrocope better, and by so placing them I can at any time set to work in a few minutes.

Some of the spectra of medicinal preparations, as Tinct. Hyoscyami, Tinct. Cannab. Ind., Tinct. Lobelia Etherica, are extremely beautiful, and will vie with any of the mineral salts commonly employed as show objects.

Microspectroscopic observations promise well to detect adulteration and substitution, for hardly ever do the spectra of any two articles appear exactly the same. The smallest discrepancy is immediately seen when the spectra are placed side by side by means of the additional prism.

It cannot be doubted that the use of the microspectroscope is of the greatest assistance in many analytical researches. It must not be expected that every mixture will show separately the several constituents by their individual peculiarities. This is only true in a few instances; cochineal may be at once detected in Tinct. Cardam. Co. and Tinct. Cinchon. Co.

The colouring matter of blood will show its own bands when mixed with cochineal. The spectrum of a tincture made with the leaves of the biennial henbane differs entirely from that of the annual.

It is often the task of the geologist to say whether a clay contains the protoxide or peroxide of iron or both. Spectral analysis will determine the question at once, and point out the protoxide, peroxide, or magnetic oxide.

Another instance is when factitious syrup of violets is sold. The spectroscope will at once tell whether the colouring matter is litmus or red poppy.

Time will not allow me to give more instances of the utility of spectral analysis, but as I before stated, it is a very extensive field for future observation, and a source of great interest and pleasure for many an hour of recreation and instruction.

The following are spectra of many of the Pharmacopœial preparations most generally used.

Inf. Rose Co.—Green extended over yellow, blue and violet quite absorbed. When alum is added, the green is totally absorbed, forming a very dark, broad band; part of the blue and all the violet are also absorbed.

Inf. Calumbæ.—Violet and half the blue absorbed.

Inf. Rhei.—Violet, blue, and part of the green absorbed.

Tinct. Aloes Barb. (Simp.).—Only the red

portion of the spectrum transmitted, all the remainder absorbed.

Tinct. Aloes Socot. (Simp.).—Green, blue and violet absorbed.

Tinct. Aloes Capens (Simp.).—Green, blue and violet absorbed.

Tinct. Arnice.—All the violet and a small part only of the blue absorbed.

Tinct. Aurantii.—The green extended over the yellow, while half the blue and all the violet are absorbed.

Tinct. Calumbæ.—Violet, blue and two-thirds of the green absorbed.

Tinct. Cannab. Indic.—A beautiful spectrum showing the dark chlorophyll band strongly at line B. The green extended over yellow, and all the blue and violet absorbed.

Tinct. Cardam. Co.—Violet and blue absorbed. When diluted, the strong cochineal line is visible at E.

Tinct. Cascarilla.—Violet, blue and one-third of green absorbed.

Tinct. Curcumæ.—Blue and violet absorbed.

Tinct. Churattæ.—As Tinct. Cascarilla.

Tinct. Cinchonæ Co.—Yellow obscured by extension of green; spectrum beyond line E absorbed.

Tinct. Cinnamomi.—From halfway beyond D to E darkened, all beyond E absorbed.

Tinct. Cocci.—Violet only absorbed, the yellow supplanted by green. Two well marked lines appear, a thin one at D and a broad one at E; a very beautiful spectrum.

Tinct. Digitalis.—Extremely handsome spectrum, exhibiting a magnificent chlorophyll line at B, and a narrow but well-marked line at D. The yellow darkened, blue and violet absorbed.

Tinct. Ferri Perchloridi.—All beyond E abruptly cut off.

Tinct. Hyoscyami (biennial).—The violet and two-thirds the blue absorbed. The green darkened and extended into the yellow. This handsome spectrum is crossed by four very distinct lines. The first a very dark chlorophyll at B. The second just beyond D is narrow. The third is a much stronger one at E. The fourth is a very broad dark band at F at the commencement of the blue.

Tinct. Hyoscyami (annual).—This spectrum is very different to the last, and cannot be mistaken for it. The chlorophyll line at B is not so decided; the second and third lines so weak as to be barely visible, and the fourth absent. Half the green is darkened, part of the blue and all the violet absorbed.

Tinct. Gentianæ Co.—Like that of tinct. aurantii, with the exception that all the blue and violet are absorbed.

Tinct. Iodi.—Impervious to light, except in a thin stratum. When diluted, the blue and violet are absorbed, and part of green much darkened.

Tinct. Jalapæ.—Last third of green and whole of blue and violet absorbed.

Tinct. Kramericæ.—Yellow and green nearly absorbed, blue and violet quite so.

Tinct. Lavand. Co.—Yellow shaded by green, and all beyond F intensely absorbed.

Tinct. Lactm.—A beautiful spectrum. All absorbed beyond G. Two distinct lines; a thick one between D and E and a thin one on E.

Tinct. Lobelia.—Green and first half of blue darkened, the remaining blue and violet absorbed.

Tinct. Lobel. Eth.—Magnificent spectrum. Very strong chlorophyll line; a fine one at D., and two very strong ones at E and F.

Tinct. Lupuli.—Green darkened; blue and violet absorbed.

Tinct. Nuc. Vom.—Similar to tinct. aurantii.

Tinct. Opii.—Red advanced over yellow, green darkened, blue and violet absorbed.

Tinct. Camph. Co.—Violet absorbed.

Tinct. Quinæ.—Green extended over yellow blue and violet absorbed.

Tinct. Rhei.—Green contracted and darkened, blue and violet absorbed.

Tinct. Sennæ.—Only red transmitted; the rest being absorbed.

Tinct. Stramonii.—Violet and half the blue absorbed.

Tinct. Sumbul.—Violet and blue absorbed.

Tinct. Ferri Acetatis.—Green, blue, and violet abruptly cut off by absorption.

Sol. Cupri Ammon. Sulph.—Red and violet only transmitted.

Dec. Aloes Co.—Only red transmitted, When diluted, three times green, blue and violet absorbed.

Ext. Betæ liquid.—Green very much darkened. Blue and violet absorbed.

Ext. Cinchonæ flav. liq.—When much diluted, red only transmitted, all the rest being absorbed.

Ext. Cinch. pallid liq.—When much diluted red and orange transmitted, all the rest absorbed.

Liq. Arsenicalis.—Yellow, green, blue, and violet abruptly absorbed.

Liq. Ferri Perchlor.—Blue, green, and violet strongly absorbed.

Liq. Ferri Permit.—Blue and green and violet strongly absorbed.

Liq. Ferri Persulph.—Green very much darkened, but not entirely, as in the other two iron solutions. Blue and violet entirely absent.

Sol. Potass. Bichrom.—Spectrum only visible to two-thirds the distance between E and F. All the remainder absorbed.

Sol. Pot. Permangan.—Well-known and exquisite spectrum. Five well-marked lines between F and D. The first thinner than the other four.

Syr. Rhæados.—Yellow, green, blue, and violet absorbed, even when much diluted.

Vinum Ferri Citratis.—Extreme end of red at commencement of spectrum green; blue and violet absorbed. Red and orange only transmitted.

Vin. Ferri.—Red and orange only transmitted. It is a peroxide of iron spectrum.

Vin. Ipecac.—Green darkened, blue and violet absorbed.

On a New and Simple Process for Fluid Extracts, by which any Drug may be Exhausted by Percolation, and without Heat.

BY SAMUEL CAMPBELL, OF PHILADELPHIA.*

The subject of fluid extracts is one that has attracted the attention of the most eminent men of our profession, and has called forth numerous essays, elaborate and seemingly unanswerable in their arguments and forms. Graham, Squibb, and Proctor, than whom we have no better authorities at the present time, have each in their turn advanced their views on the subject of percolation and menstruums required to form perfect fluid extracts, and no doubt have given to the medical world a beautiful and substantial theory; and yet if any one will take the time and

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