SCIENTIFIC APPARATUS AND LABORATORY METHODS

CONTROL OF ULTRA-VIOLET RAY LAMPS

INVESTIGATIVE work with ultra-violet ray lamps is handicapped considerably by the difficulty in obtaining equal doses of irradiation during a time unit in serial experiments. Not only will irradiation provided by different lamps of the same make vary widely, but also the effect of one lamp at different times. For accurate experimental results it is therefore necessary to determine the irradiation power of the lamp frequently, if not before each experiment. A simple method of ultra-violet lamp control is employed in the writer's laboratory.

The iodized oil preparations which are in clinical use for roentgenographic contrast effect (in bronchography, etc.) are chemical compounds of vegetable oils and of a high percentage of iodine. The French preparation "Lipiodol" (Lafay) which we use is a compound chiefly of poppy-seed oil and 40 per cent. of iodine. Its content of free iodine seems to be quite constant at .03 mg per cc of Lipiodol. Under the influence of daylight additional iodine is freed slowly from the compound, while under irradiation with ultra-violet light the decomposition of the oil occurs with great swiftness, beginning after 35 seconds of irradiation. Determination of the free iodine content after irradiation over a given period furnishes an excellent indication of the power of the lamp at the moment. The following procedure of irradiation and of titration of free iodine is employed.

For practical purposes it is sufficient to employ one irradiation period and, for instance, judge the power of the lamp by the free iodine content in the oil after five minutes' irradiation.

TITRATION OF IRRADIATED LIPIODOL FOR FREE IODINE

Distance of ultra-violet lamp: 30 cm.
Lipiodol in Stender dish, layer 2½ mm.
Dissolve 2 cc of the irradiated Lipiodol in 10 cc CCl_4 (Carbon tetrachloride).
Add 10 cc of 10 per cent. KI (Potassium Iodide).
Acidify with HCl. Starch as indicator.
Titrate with 1/1000 N Sodium Thiosulphate ($Na_2S_2O_3$)

$$\text{Calculation: } \frac{\text{gms } Na_2S_2O_3}{\text{MW } Na_2S_2O_3} = \frac{X}{\text{MW } I_2}$$

X = gms I_2 freed from Lipiodol

EXAMPLE OF RESULTS

Amount of Lipiodol	Time of irradiation	cc 1/1000 N $Na_2S_2O_3$	mg Iodine per cc of Lipiodol
2 cc	15 sec.	.5	.032
2 "	35 "	.5	.032
2 "	1 min.	.9	.057
2 "	2 "	1.6	.101
2 "	3 "	2.0	.127
2 "	4 "	2.4	.152
2 "	5 "	2.5	.158
2 "	6 "	2.7	.171
2 "	7 "	3.6	.228
2 "	10 "	5.1	.323

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CELLOPHANE AS A SUBSTITUTE FOR MICA

I AM taking this means of acquainting my fellow workers in the field of mineralogy and petrology with the uses I have made of cellophane. Any one who has attempted to make quarter-wave mica plates or to build up a mica wedge or to make a Bravais Test Plate is well acquainted with the difficulty encountered in obtaining plates of mica of the same thickness. I accidentally discovered that cellophane was doubly refractive and remarkably uniform in thickness. With this material I have made practically every kind of accessory for which mica is usually employed, with very little effort because of the abundance of the material. The usual accessories are rather expensive and schools and colleges can rarely afford to supply all their pupils with them. It would be perfectly possible and I believe would lead to a better understanding of the phenomena revealed if the pupils were taught to make their own accessories using this material.

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SPECIAL ARTICLES

HISTOLOGICAL BASIS OF SEX CHANGES IN THE AMERICAN OYSTER (OSTREA VIRGINICA)

IT has long been known[1] that the European oyster (*O. edulis*) is hermaphroditic, with more or less regularly alternating changes of sex during its lifetime. More recently the writer[2] found that in *O. lurida* on the coast of southern California similar changes of sexual phase occur in rhythmical sequence, following a preliminary male phase. In the latter species the gonads of young animals always contain both ovogonia and spermatogonia, but the female cells are delayed in their development until after the completion of the male phase. Following the discharge of most of the sperm the female phase is assumed, but before ovulation has occurred residual spermatogonia

[1] J. H. Orton, *Jour. Mar. Biol. Ass.*, 14: 967–1045, 1926–27.

[2] W. R. Coe, SCIENCE, 74: 247–249, 1931; *Bull. Scripps Inst. Oceanog., Tech. Ser.*, 3: 119–144, 1932.