

ABSTRACTS OF PAPERS OF 1966 SPRING MEETINGS, COLLEGIATE SECTION, TENNESSEE ACADEMY OF SCIENCE

High Resolution Studies of Atmospheric Absorption Spectra.

James McKnight, Southwestern at Memphis. The purpose of this project was to study the position and relative intensity of atmospheric absorption bands, utilizing a high resolution grating spectrometer, Perkin-Elmer model 112G. The project was divided into two parts, one using the sun as a source of radiant energy, while the other used a carbon-arc searchlight with a path distance of 1000 feet. The studies were made over the regions of 0.5 micron to 15 microns with data taken from 1300 to 1600 hrs. CST using the sun and from 2000 to 0200 hrs. CST using the searchlight.

Comparative Analysis of Pigments in Five Species of Oak. Paul Hayes, Christian Brothers College. Leaves were collected in late summer from Red, White, Willow, Water and Live Oaks. Each species was treated in the following manner: 50 g. of leaves were allowed to dry in the dark for two weeks, then ground to a powder. The pigments were extracted for 24 hours in the dark, using 100 ml. of 90% aqueous methyl alcohol per 10 g. of leaf. Counter current distribution using a system of 90% aqueous methyl alcohol and cyclohexane, ninety-six transfers, six tips and 15 minutes settling time separated the pigments. These were identified by reading their spectra from 700 to 350 millmicrons and comparing them to published spectra.

Red and White Oak leaves had similar pigment content: 2 chlorophyll a derivatives, 2 chlorophyll b derivatives and 1 carotene derivative. Water and Willow Oak leaves had one more carotene derivative than the leaves of the White and Red Oaks. Live Oak leaves had a chlorophyll a derivative and a chlorophyll b derivative not found in the other Oaks and a much higher content of chlorophyll b.

Ketone	Kx10 ³ hrs ⁻¹ at 99.8°C	Kx10 ³ hrs ⁻¹ at 117.5°C	Kx10 ³ hrs ⁻¹ at 127.5°C
2-Benzylbenzophenone	8.32	45.1	93.7
p-Cl-2-Benzylbenzophenone	7.04	45.1	91.9
m-CF ₃ -2-Benaylbenzophenone	9.60	65.1	92.2
o-F-2-Benzylbenzophenone	4.86	27.6	42.5
o-Cl-2-Benzylbenzophenone			29.7
o-Br-2-Benzylbenzophenone			6.3

Use of Iron-59 for Measuring Blood Gorging and Regurgitation by Horse Flies. Sam L. Hansard II, University of Tennessee. As an approach to the study of disease transmission by horseflies, a sensitive procedure has been investigated to measure the volume of blood ingested, and to determine if the gorged flies could transfer blood from one animal to another by regurgitation. Iron-59 was used to label the RBC of the donor animal (calf). A series of time studies using

A Photoelectric Study of the Variable Star RZ Cassiopeia. William R. Boy, King College. During the past two years a study has been made of the eclipsing binary star, RZ Cassiopeia. This star is a short-period variable not visible to the naked eye. Measurements of the time of minimum brightness have been made using the 12½" Newtonian type telescope and photoelectric photometer at the King College Observatory. These measured times have been compared to the calculated times of minimum brightness. The differences between observed and calculated times indicate that the period of RZ Cassiopeia has changed. The new value of the period is 1.d952414.

A Polarographic Study of the Kinetics of the Cyclo-dehydration of 2-Benzylbenzophenones. James C. Wolford, King College. The reaction involved is of the first order, and can be followed by measuring the disappearance of the ketone polarographically using solutions of 10⁻⁴M ketone. For purposes of analysis a basic solution with potassium chloride as an electrolyte and a trace of brucine to eliminate current maxima is used. The polarograph gives a measure of the diffusion current of a solution, and then the ketone concentration is obtained from a calibration curve. All reactions were carried out in an acidic solvent made up of 90.7 ml of glacial acetic acid and 12.0 ml of constant boiling hydrobromic acid. The reaction mixture was kept in a constant temperature bath while reacting, and placed in a bath of 0°-5°C. to terminate reaction. It has been possible to determine the rates for four selected ketones at three different temperatures. The rates for two other ketones were slow at the lower temperatures and time did not permit accurate measurements of their rates at the lower temperatures. The rates are such as to agree with the proposed mechanism and with earlier work of this type.

T. lineola and T. fuscicostatus flies indicated these 90 mg. (average) flies to feed for about 20 minutes, and to take up about 60 Lambda of whole blood into the abdomen (95%), where it remained even after re-feeding on the control animal. There was no evidence of blood transfer from fly to host through refeeding by regurgitation.

Condensation of d-10-Camphorsulfuric Acid with Urea: A Study of Some Physical Properties and Chemi-

cal Structures. F. Michael Butler and Marjorie Nan Helms, Lambuth College. d-10-camphorsulfonic acid was condensed with urea by stirring in water. The mixture was heated and stirred until a thick syrup was obtained. The syrup was decolorized with Darco, filtered through celite and crystallized from acetone.

Carbon and hydrogen analysis agreed with the theoretical composition with one molecule of water of hydration: C, 45.27; H, 6.89; N, 9.70; S, 10.99. Theoretical composition: C, 45.20; H, 6.89; N, 9.60; S, 10.96. The molecular weight of the hydrated form was 292.35. The infrared curves were recorded for a d-10-camphor-sulfuric acid and for d-10-camphor-sulfonic acid monohydrate. The infrared curves indicate the urea molecule has been condensed with the d-10-camphor-sulfonic acid molecule. The equivalent weight was determined by titration with a standard base and found to be 290.0. The melting point was 157°C.

Preparation of Some Complexes of N, N, N', N'-tetramethylmalonithionamide. Charles Doughty, Douglas Neeley, Lowell Lawson, and Robert Ziegler, Lincoln Memorial University. N, N, N', N'-tetramethylmalonithionamide was prepared by reacting P_2S_5 with N, N, N', N'-tetramethylmalonamide. The N, N, N', N'-tetramethylmalonithionamide was reacted with nickel, cobalt, copper, and zinc perchlorates and the resulting compounds were characterized by analysis and melting points. The following compounds were obtained: $[Zn(C_7H_{14}N_2S_2)_2](ClO_4)_2$ and $[Ni(C_7H_{14}N_2S_2)_2](ClO_4)_2$. The compounds with cobalt and copper perchlorate were seemingly impure and good analysis.

Magnetic Properties of Some Complexes of N, N, N', N'-tetramethylmalonithionamide. Douglas Neeley, Charles Doughty, and Lowell Lawson, Lincoln Memorial University. A Gouy balance was constructed to measure the magnetic moments of transition metal compounds. Attempts were made to measure the magnetic moments of the complexes of cobalt, nickel, and copper perchlorate with N, N, N', N'-tetramethylmalonithionamide using this Gouy balance. A value of 4.39 Bohr magnetons was found for $Ni(C_7H_{14}N_2S_2)_2(ClO_4)_2$. Since the cobalt compound was not pure we are not certain of its value. The copper possibly was in the plus one state since it appeared to be diamagnetic.

A Synthetic Approach to Citric Acid Asymmetry. John Geltosky, Memphis State University. It is well known that when one synthesizes asymmetrical com-

pounds from symmetrical reactants one obtains a racemic mixture. Dr. Don P. Claypool, who initiated the work on this project, believes that he has synthesized a non-racemic mixture from symmetrical reactants. Citric acid asymmetry may be defined as the reaction of an apparently symmetrical molecule in the presence of an asymmetrical substrate to yield an optically active product in which one enantiomer is favored over the other. This phenomenon was first observed in the enzymatic conversion of citric acid to isocitric acid. Ogston believed that a non-racemic mixture was produced because of nonequivalence in the enzyme. Schwartz and Carter believe that such cases were caused by stereochemical non equivalence between two apparently similar groups.

A series of non enzymatic reactions, outlined by Choi in his M.S. Thesis of 1963, were carried out to synthesize the asymmetrical compound. Two compounds were synthesized that form an enantiometric pair. These two compounds were not isolated, but were oxidized to beta-benzyl adipic acid which has a specific rotation of -19.39° . This proves that a non-racemic mixture was produced from the pyrolysis reaction. If we look at the ester more closely, and assume the end group to be in an axial position and also assume that the two hydrogens cis to this group are eliminated, we see that the two cis hydrogens appear to be equal, but for some unknown reason, one hydrogen is eliminated more easily than the other.

Haemoproteus sp. A Parasite Found in Pigeons of East Memphis. Ronald G. Chesemore, Memphis State University. *Haemoproteus* sp. and its vector, a hippoboscid fly, have been found in the pigeon, *Columba livia*, of East Memphis. Over a period of five months, July through November, thirty pigeons were captured for the study. Peripheral blood smears were strained with a 0.5% solution of Giemsa stain and upon examination revealed the presence of halter-shaped gametocytes which were identified as *Haemoproteus*. The individual percent of infection was determined from the number of parasitized cells found in every 1000 erythrocytes. Of the birds infected with *Haemoproteus*, the percentage of infection ranged from 1.3% to 33.6%. Many erythrocytes contained a multiple infection, possessing as many as two to four gametocytes per cell. The total population percentage revealed that twenty four of the thirty birds captured or 80% of the population was infected with *Haemoproteus*.

REVISED NAME FOR A NEW SPECIES OF OSTRACOD FROM TENNESSEE

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Cypridopsis bisexualis Cole, new name for *Cypridopsis compressa* Cole, 1965, J. Tenn. Acad. Sci. 40(4): 137-133, figs. 34-47, not Chapman, 1935, Proc. Roy. Soc. Queensland 46: 68, pl. 2, figs. 2 a, b.

Since the author was notified by H. V. Howe that *Cypridopsis compressa* Cole, 1965, is preoccupied by *C. compressa* Chapman, 1935, *C. bisexualis* is proposed as a substitute name for the former. *C. compressa*

Chapman is a Tertiary fossil from near Brisbane, Australia. The two species involved she believed to be congeneric; therefore, *C. compressa* Cole, the junior homonym, must be rejected.

LITERATURE CITED

- *Chapman, F. 1935. Reports on samples of surface Tertiary rocks and a bore sample containing Ostracoda from Queensland. Proc. Roy. Soc. Queensland 46:66-71, pl. 2.
 Cole, M. E. 1965. Seven new species of ostracods from Tennessee (Cypridae: Candocyprinae and Cypridopsinae). J. Tenn. Acad. Sci. 40(4) : 137-138, figs. 34-47.

* Not consulted in the original by the author.

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