Electrical conductivity measurements indicate that III behaves in aqueous solution as a binary strong electrolyte.

The d-α-bromocamphor-π-sulfonate of this cobaltic complex of I can be prepared from II and silver d-α-bromocamphor-π-sulfonate, and separated from a mixture of methanol and ether into a sparingly soluble crystalline brown solid (IV) and a very soluble gum (V). The aqueous solution of IV is strongly levorotatory, a 0.01% solution having a specific rotation of $-7{,}000°$ (Hg green line 5461). Iodides precipitate from this solution the levorotatory iodide l-$[\mathrm{CoS}]^+\mathrm{I}^-$ (found: C, 41.5; H, 3.8; N, 4.9. I, 22.0%) m. p. 268° (dec.). After six recrystallizations from 20% methanol–water, the molecular rotation (Hg green line) was $-50{,}160°$. Solutions of this salt can be boiled for twenty minutes without appreciable racemization. The aqueous solution of V is strongly dextro-rotatory. From it, after considerable difficulty the pure d-iodide was obtained, with molecular rotation of $+50{,}160°$ (nine recrystallizations of the iodide were necessary).

Models show that I can function as a sexadentate chelate compound, occupying all six octahedrally disposed coördination positions about a six-covalent atom in one or other of two enantiomorphous strainless configurations provided that the nitrogen atoms are in *trans* positions and the sulfur atoms and oxygen atoms in *cis* positions to each other. The experimental evidence is wholly in favor of I being able to function as a sexadentate chelate compound.

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RECEIVED OCTOBER 14, 1947

α-PELTATIN, A NEW COMPOUND ISOLATED FROM *PODOPHYLLUM PELTATUM*

Sir:

The drug podophyllin N. F., prepared from the dried rhizomes and roots of *Podophyllum peltatum* L., has been shown to produce severe damage to mouse tumor cells both *in vivo*[1,2a] and *in vitro*.[2b] Chemical fractionation involving solvent extraction and chromatographic adsorption on alumina,[2a] guided by bioassay,[3] yielded two tumor-necrotizing agents in pure form. One of these was identical with the well-known podophyllotoxin; the other was a new substance which was provisionally referred to as NCI-1074.

The new compound, for which the name α-peltatin is proposed, has now been conveniently isolated from podophyllin in a yield of about 9% by chromatographic adsorption on alumina. α-Peltatin crystallizes from alcohol in colorless, transparent prisms, m. p. 230.5–232.5° (cor.) (shrinks at 222.5° and darkens at m. p.); $[\alpha]^{20}\mathrm{D}$ $-115°$ (c 1.0, absolute alcohol).[4] *Anal.*[5] Calcd. for $(\mathrm{C}_{11}\mathrm{H}_{11}\mathrm{O}_4)_x$: C, 63.75; H, 5.35. Found: C, 63.4; H, 5.3. Calcd. for one methoxyl group per C_{11} unit: 15.0; found, 15.7. Discrepancies between the values for the molecular weight as determined by different methods make it impossible to report a true value at this time; other methods are being tried.

Solutions of the pure substance in alcohol and benzene exhibit a strong blue fluorescence under ultraviolet light, in distinction from solutions of podophyllotoxin which have only a weak blue fluorescence.

Structural, pharmacological and cytological studies with α-peltatin are in progress.

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(1) M. Belkin, *Federation Proceedings*, **6**, 308 (March, 1947).

(2) (a) J. L. Hartwell and M. J. Shear; (b) R. A. Ormsbee and I. Cornman: both papers presented before the American Association for Cancer Research, annual meeting, May 16, 1947. Abstracts in *Cancer Research*, in press.

(3) The bioassay phase of the coöperative project was carried out by Dr. Virginia Downing, Mr. A. Perrault, and Dr. M. J. Shear

(4) Through the courtesy of Dr. N. K. Richtmyer, National Institute of Health.

(5) By Mr. C. A. Kinser and Mrs. M. M. Ledyard, National Institute of Health.

NATIONAL CANCER INSTITUTE,
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ELECTROPHORETIC RESOLUTION OF HEPARIN AND RELATED POLYSACCHARIDES

Sir:

Sodium heparinate has been found to give an electrophoretic pattern indicating the presence of two components. The apparatus described by Longsworth and MacInnes[1] was used. The schlieren method was employed in photographing the moving boundaries.[2]

One per cent. solutions of the sodium salt of heparin (prepared from the crystalline barium acid salt of 500–600 Roche anticoagulent units[3] per mg.) in acetate and phosphate buffers of ionic strength 0.2 separated into two fractions under a potential gradient of 3 to 5 volts/cm. The major component migrated as an anion with a mobility at 0° of 0.8×10^{-4} to 2.4×10^{-4} cm.²/sec./volt over a pH range of 3 to 9. The higher values were obtained in the alkaline range.

The minor component was electrically neutral and sulfate-free. From the peak areas the two fractions were found to be present in approximately a 3:2 weight ratio.

A comparison between the schlieren patterns obtained when the boundaries moved through the buffer and when they moved through the solution indicated that there was an association between the two components.

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(1) L. G. Longsworth and D. A. MacInnes, *Chem. Revs.*, **24**, 271 (1939).

(2) We are indebted to Professor W. G. France and Dr. Q. Van Winkle of this Laboratory for assistance in the electrophoretic techniques and to Hoffmann-La Roche, Inc., of Nutley, New Jersey, for the bioassays.

(3) R. H. K. Foster, *J. Lab. Clin. Med.*, **27**, 820 (1942).