

triarylbi-muth derivative in dry ether. A bright yellow powder rapidly separated out. It melted indefinitely when heated and probably contained some dichloride.

*Anal.* Calcd. for  $C_{24}H_{18}BiCl$ : Cl, 6.5. Found: Cl, 7.0.

**Tri-biphenylbi-muth Dinitrate.**—Alcoholic silver nitrate solution was added to an equivalent amount of tri-biphenylbi-muth dichloride suspended in a large volume of acetone. On concentrating the filtrate after removal of insoluble material, small plates were obtained that decomposed at approximately  $162^{\circ}$ , but deflagrated if heated quickly.

*Anal.* Calcd. for  $C_{36}H_{27}BiO_6N_2$ : Bi, 26.4. Found: Bi, 26.6.

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### Chile Seed

By W. A. BUSH

The seeds of the Chile pepper (sometimes called pimento) obtained from the pods of the Southern Pacific Coast cultural variety of *Capsicum Annuum* have received little mention in the literature from the point of view of their composition.

A representative sample of a quantity of sixteen tons of dried seeds accumulated during a year from pods mostly of Californian origin gave re-

sults differing somewhat from those obtained by Ebert and Bailey<sup>1</sup> from Southeastern seed.

Yields from the seed by drying and extraction were: oil, 26.10%; moisture, 6.25%; dried extracted meal, 67.65%. Analysis of the meal, free from oil and moisture, shows: protein ( $N \times 6.25$ ), 28.92%; fiber, 29.10%; ash, 5.61%; N-free extract (carbohydrates), 36.37%. The constants of the oil, obtained by hot pressing ( $100^{\circ}$ ) and then filtering are

Specific gravity, $24.5^{\circ}/25^{\circ}$	0.918
Refractive index at $25^{\circ}$	1.4738
Color (2.54 cm. column, Lovibond)	100 yellow—46 red
Acid number	2.18
Iodine number, Hanus	133.5
Acetyl number	7.0
Saponification number	192.0
Unsaponifiable matter	1.7%
Melting pt. of separated fatty acids	$21.2^{\circ}$

The resemblance to tomato seed oil is striking.<sup>2</sup> However, the presence of colored veins on the outer edges of the seeds imparts to the oil the deep color noted above and a characteristic burning taste and paprika-like aroma.

LOS ANGELES, CALIF.

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- (1) H. C. Ebert and H. S. Bailey, *Cotton Oil Press*, 7, 35 (1924).  
(2) Felice Sorgès, *Chim. Ind. Agr. Biol.*, 5, 232 (1929); N. Barskii, *Masloboino-Zhirovoe Delo*, No. 6, 56 (1932).

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## COMMUNICATIONS TO THE EDITOR

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### MUREXIDE AND LEUCOMUREXIDE

Sir:

The recent publication of Kuhn and Lyman [*Ber.*, 69, 1547 (1936)] concerning the oxidation-reduction potential of murexide prompts this report of results obtained in this field.

**Preparation of Murexide.**—The uncertainty in the preparation of murexide emphasized by previous writers including Kuhn and Lyman (who obtained only a 2% yield) has been removed by employing glacial acetic acid as the reaction medium. Furthermore, recrystallization has been effected without heating, by salting out at room temperature. Thus, 16.1 g. of finely

powdered alloxantine suspended in 1600 cc. of boiling glacial acetic acid and treated with 80 g. of ammonium acetate with continued boiling for 1–2 minutes gave, on cooling, filtering, washing with acetic acid, alcohol and ether, and drying at  $100^{\circ}$ , 14.0 g. (calcd. 14.2 g.) of crude murexide. One gram of this dissolved in 900 cc. of water at  $30^{\circ}$  gave, on salting out the filtered solution with 60 g. of ammonium chloride, filtering, washing with 60% methanol and then with absolute methanol, and drying at  $110^{\circ}$ , about 75% of beautiful, reddish-brown crystals possessing a green reflex, which, on titration with sodium hydrosulfite, were found to be pure murexide.

**Reduction of Murexide.**—Leucomurexide has not been described previously, although postulated by Labes and Freisburger [*Arch. expl. Path. Pharmacol.*, 156, 226 (1930)] as well as by Kuhn and Lyman. One gram of pure murexide dissolved in 900 cc. of water at 30° was treated with a filtered solution of one g. of sodium hydrosulfite in a mixture of 20 cc. of water and 10 cc. of ammonia. In a few moments complete decolorization occurred. Salting out with 60 g. of ammonium chloride gave on filtering, washing with 60% methanol and finally with absolute methanol, and drying at 110°, 0.98 g. (98%) of a buff-colored microcrystalline powder which turned pink in the air. It contained the theoretical percentage of nitrogen for ammonium dihydropurpurate. Since its composition is identical with uramil (its molecular formula is simply twice that of uramil), a distinguishing test was sought. This was found in the action of potassium ferricyanide, which immediately converts leucomurexide to murexide, while uramil yields colorless oxidation products. Aeration of a dilute suspension of leucomurexide in water quickly regenerates murexide, 70% (by titration) having been obtained in one experiment after thirty minutes of aeration.

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#### RHEOPEXY IN BENTONITE

Sir:

Recently during the course of an investigation in the thixotropic properties of the clay mineral bentonite, gels showing pronounced rheoplectic properties were observed. These gels are of particular interest inasmuch as Freundlich and Juliusburger in the original article describing rheopty [*Trans. Faraday Soc.*, 31, 920 (1935)] state that they were unable to find any evidence of rheopty in bentonite.

The discovery of rheopty in bentonite may be attributed to a new technique of fractionation which the authors have developed and described at the thirteenth Colloid Symposium at St. Louis, Mo., in June of 1936. Natural bentonite is dispersed in distilled water and then run through a high speed continuously fed centrifuge of the Sharples type. At various distances up the centrifuge bowl different particle size fractions of bentonite are removed and then

refractionated. The finest fractions are a beautiful perfectly transparent golden-yellow color and completely amiconic while the coarser fractions are more opaque. There is a large percentage of amiconic particles present in the Wyoming Bentonite being used. By such a method of preparation the authors are establishing the influence of particle size upon thixotropy and rheopty in bentonite.

Specifically 10 cc. of a very fine fraction (1.3% bentonite) was placed in a test-tube 1 cm. in diameter and 1 drop of saturated potassium chloride added. The setting time at 23° when the tube was kept perfectly still was twenty-five minutes, whereas slight tapping of the tube on a pad of rubber reduced the setting time to fifteen seconds. Additional potassium chloride makes it so stiff that it cannot be liquefied. Such a gel is perfectly transparent. In addition these fine bentonite fractions show pronounced streaking upon being stirred. This streaking phenomenon is greatly increased after electro dialysis. Altogether the bentonite fractions prepared in this manner act very similarly to the vanadium pentoxide system described by Juliusburger and Pirquet [*Trans. Faraday Soc.*, 32, 445 (1936)].

From a consideration of the properties of a 1.3% bentonite gel in comparison to those gels of 10–20% concentration described by Freundlich, Schmidt and Lindau [*Kolloidchem. Beih.*, 36, 43 (1932)], one is forced to the conclusion that particle size is of paramount influence in this case of thixotropy. In fact we have found evidences of gel structure at concentrations as low as 0.01% by wt. in the low colloidal range. It may be stated, however, that if hydrogen bentonite produced by electro dialysis is ever allowed to dry, it fails to exhibit thixotropy in low concentrations. This property can still be observed providing the material is never allowed to dry.

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#### EXCHANGE BETWEEN SODIUM IODIDE AND ETHYL IODIDE\*

Sir:

It was reported a few months ago in these columns [Hull, Schifflett and Lind, *THIS JOURNAL*,

\* This work was supported in part by the Fluid Research Fund of the Graduate School.