pump, washed five to ten times with 2-cc. portions of the reagent then with 95 per cent alcohol previously saturated with sodium-zinc-uranyl acetate. Finally the alcohol is removed by washing with ether and the precipitate dried by drawing air through the funnel. The precipitate is weighed after standing for ten minutes in the balance case.

One milligram of sodium yields 66.88 mg. of sodium-zinc-uranyl acetate. The weight of the precipitate, multiplied by 0.01495 (= (1/66.88)) represents the quantity of sodium (Na) present.

In analyzing the solution resulting from the determination of the solubility of sodium sulphate in glycerin it was found, that the sodium-zinc-uranyl acetate was not completely precipitated after standing for half an hour. Glycerin evidently retards the precipitations. The following data illustrate the retarding effect of a 20 per cent aqueous glycerin:

Time in minutes.	30	40	45	80	180
Gm. of precipitate obtained from equal amounts of solution	0.1823	0.1899	0.1909	0.1914	0.2010 0.2007

COMMENTS ON THE U. S. P. X TEST FOR RHAPONTIC RHUBARB.*

BY R. A. KONNERTH AND R. E. SCHOETZOW.

A lot of Rhubarb which macroscopically closely resembled the Rhapontic variety recently was brought to our attention.

The U. S. P. X test for Rhapontic Rhubarb was applied with negative results. The same determination was made on a sample of true Rhapontic Rhubarb and much to our surprise this also failed to produce a positive reaction.

The German Pharmacopœia was then consulted and by following the technic therein described, crystalline precipitations were obtained in the Rhapontic as well as in the sample under examination.

We wish to point out that the U. S. P. X test for Rhapontic Rhubarb is not reliable.

The U. S. P. sets a time limit of 24 hours. We found that by the U. S. P. X test, Rhapontic Rhubarb requires more than 24 hours for the crystallization of Rhaponticin. Under certain conditions no crystallization occurs. The container in which the test is set aside for observation should be described since the reaction may be overlooked if allowed to take place in a separatory funnel. Crystallization is more readily detected when the test is run in a (1 x 8") test-tube.

We urgently recommend the U. S. P. adoption of the method given in the German Pharmacopœia: "Deutsches Arzneibuch," 6 Ausgabe (1926), 584.

Below are given the two methods for the detection of Rhapontic Rhubarb as outlined in their respective pharmacopœias:

GERMAN PHARMACOPŒIA.

Five grams of powdered Rhubarb are refluxed on the steam bath for 15 minutes with 22 cc. alcohol (68% vol.), filter to exhaustion and wash residue with 22 cc. hot alcohol (68% vol.).

* Scientific Section, A. PH. A., Rapid City meeting, 1929.

Collect the filtrates and evaporate in a tared evaporating dish to 3–4 Gm. While warm transfer the residue to a strong test-tube, cool and add 5 Gm. ether. Stopper with a cork. Shake thoroughly and set aside. No needle-shaped crystals should form in the ether or on the walls of the test-tube, even after standing several days.

U. S. PHARMACOPŒIA X.

Boil 10 Gm. of powdered Rhubarb for fifteen minutes with 50 cc. of diluted alcohol under a reflux condenser, filter and concentrate to 10 cc. Cool, shake with 15 cc. of ether, and set aside for twenty-four hours: Yellowish, prismatic crystals should not form (Rhapontic Rhubarb).

ANALYTICAL DEPARTMENT OF THE BROOKLYN LABORATORIES,
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BIOASSAY OF CAPSICUMS AND CHILLIES I.*

BY JAMES C. MUNCH.[1]

Capsicum is defined in U. S. Pharmacopœia X (31) as "the dried ripe fruit of *Capsicum frutescens* Linné (*Fam. Solanaceæ*), grown in Africa." In addition to the commercial varieties imported from Africa, under the trade names Zanzibar, Mombassa and Sierra Leone, a number of other species have been developed in Japan and India, the United States and Mexico. Capsicum is used internally as a condiment and carminative and externally as a counterirritant (23).

A number of products have been isolated from capsicum and believed to be the active principles. Heydenreich (7) reported, in 1858, that two oily, non-crystallizable substances differing in alcohol solubility were the active constituents. The sharp tasting principle was designated "capsicin" by Bucholz (2) and by Landerer (8), but this name has been applied to the ethereal extract (3), as well as to the alcoholic extract (30). Buchheim (1) claimed, in 1873, that a dark red oil was the pungent principle. Three years later Thresh (28) stated that the active principle was "capsaicin," which is apparently identical with a product "capsicutin" isolated by Morbitz (12). Micko (11), Meyer (10) and Strohmer (27) established that the crystalline constituent, "capsaicin," was the active pungent and irritant principle. Micko announced the formula to be $C_{18}H_{28}NO_3$, but Nelson in a series of papers (13, 14, 15, 16) reports his experiences in isolating crystalline capsaicin and determining its structure. He obtained 50 Gm. of recrystallized capsaicin from 50 pounds of cayenne pepper. Study with this material showed that it was methyl-nonenyl-vanillyl-amide, with the formula $C_{18}H_{27}NO_3$. He synthesized a number of pungent substances of similar composition.

According to various authors (3, 29) the capsaicin content of various species of capsicum ranges from 0.01 per cent to 0.07 per cent or higher. Micko reports that *C. fastigiatum* contains twenty times as much capsaicin as *C. annum* (29). Morbitz (12) stated that *C. fastigiatum* contains 0.05 to 0.07 per cent of capsaicin.

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* Scientific Section, A. PH. A., Rapid City meeting, 1929.

[1] Grateful acknowledgment is made to H. H. Crosbie for pharmacognostic identification of the products used in this investigation; to C. Jelleff Carr for the preparation of some of the solutions tested; and, finally, to the 100 collaborators who tested weird drinks in connection with this investigation.