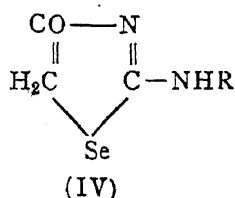
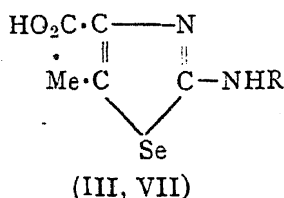
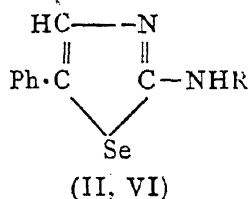
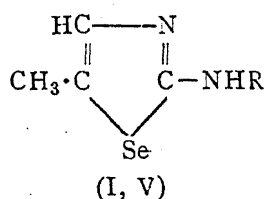


### SYNTHESIS OF SULPHANILAMIDO SELENAZOLES

*p*-ACETAMINOBENZENE-SULPHOCHLORIDE has been made to react with (i) 2-amino-4-methylselenazole, (ii) 2-amino-4-phenyl-selenazole, (iii) 2-amino-4-methyl-5-carboxy-selenazole and seleno-hydantoin, to give 2-(*p*-acetamino-benzene-sulphonyl)-amino-4-methyl selenazole (I), m.p. 228-29°; 2-(*p*-acetamino-benzene-sulphonyl)-amino-4-phenyl selenazole- (II), m.p. 238-239°; 2-(*p*-acetamino-benzene-sulphonyl)-amino-4-methyl-5-carboxy-selenazole (III), m.p. 238-39°; and 2-(*p*-acetyl-amino-benzene-sulphonyl)-amino-seleno-hydantoin (IV), m.p. 263-64° (decomp.); respectively. The acetyl-compounds (I), (II) and (III) gave 2-(*p*-amino-benzene-sulphonyl)-amino-4-methyl-selenazole (V), m.p. 222-23°; 2-(*p*-amino-benzene-sulphonyl)-amino-4-phenyl-selenazole (VI), m.p. 231-32°; and 2-(*p*-amino-benzene-sulphonyl)-amino-4-methyl-selenazole-5-carboxylic acid (VII), m.p. 231-32°. Their toxicity and antibacterial properties are being studied.



[I-IV, R = -SO<sub>2</sub>·C<sub>6</sub>H<sub>4</sub>-NHAc]  
[V-VII, R = -SO<sub>2</sub>·C<sub>6</sub>H<sub>4</sub>-NH<sub>2</sub>]

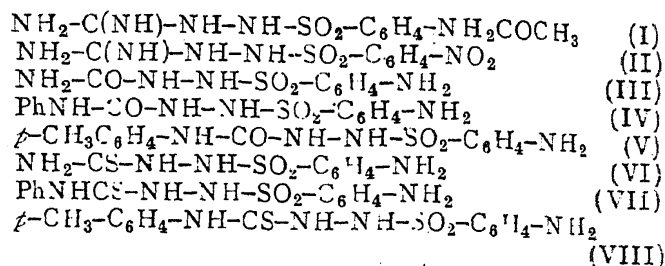
Organic Chemistry Section,  
Dept. of Pure & Applied Chemistry,  
Indian Institute of Science,  
Bangalore,  
March 12, 1943.

P. C. GUHA.  
A. N. ROY.

### SYNTHESIS OF SULPHANILAMIDE COMPOUNDS CONTAINING SEMI- CARBAZIDE-, THIOSEMICARBAZIDE- AND AMINO-GUANIDINE-RESIDUES

SULPHANILAMIDE compounds with urea, thio-urea and guanidine have already been made. Alles<sup>1</sup> has made the interesting observation that aminoguanidine shows much less toxicity than guanidine. Sulphanilamide compounds of the amino-derivatives of urea, thiourea and guanidine or, in other words, of semicarbazides, thio-semicarbazides and aminoguanidines, have now been prepared.

The following compounds as also acetyl derivatives of III-VIII have been made:—



The pharmacological studies of these compounds are in progress.

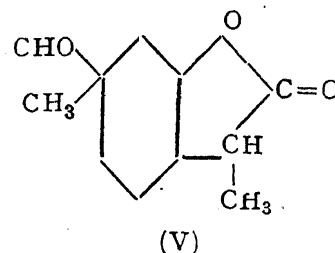
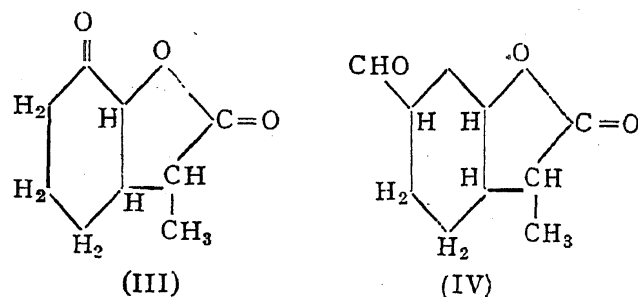
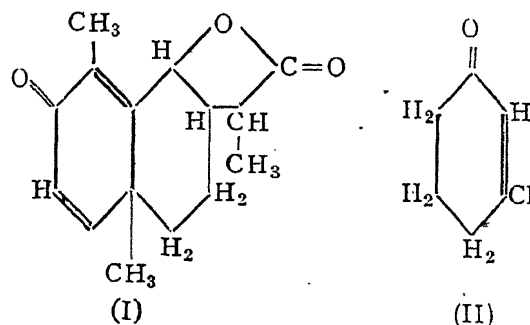
Organic Chemistry Section,  
Dept. of Pure & Applied Chemistry,  
Indian Institute of Science,  
Bangalore,  
March 12, 1943.

P. C. GUHA.  
K. L. HANDA.

1. *J. Pharm. Soc.*, 1926, **28**, 251.

### SYNTHESIS OF SANTONIN

SANTONIN, the classical remedy for the treatment of ascaris or round-worms and oxyuris, is the chief constituent of the leaves of *Artemisia maritima* Linn. The chemical investigation of santonin has been carried out by Clemo, Haworth and Walton.\* We have now achieved the synthesis of santonin by the series of reactions outlined below.



3-Chloro-Δ<sup>2</sup>-cyclohexen-1-one (II) on treatment with the Sodium Derivative of methyl malonic ester followed by hydrolysis with 30 per cent. sulphuric acid in dilute alcohol gave the keto lactone (III), which on condensation with ethyl formate gave (IV). Methylation of

(IV), effected by the treatment of its sodium compound with methyl iodide, gave (V). Condensation of (V) with methyl ethyl ketone took place, fortunately, in the desired direction and gave rise to santonin (I). The compound thus prepared had m.p. 171° C. and did not depress the m.p. of an authentic sample of santonin. It formed a semicarbozone identical with santonin semicarbozone. The synthetic product is, however, optically inactive. Details of the synthesis will be published shortly.

Maharaja Pratapsingh  
Chemical Laboratory, (Miss) K. PARANJAPE.  
S. P. College, N. L. PHALNIKER.  
Poona 2, B. V. BHIDE.  
May 10, 1943. K. S. NARGUND.

\* Clems, Haworth and Walton, *J.C.S.*, 1929, 2368; 1930, 2579.

### ISO-AMYL ALCOHOL AS A SOLVENT FOR THIOCHROME IN THE CHEMICAL ASSAY OF VITAMIN B<sub>1</sub>

IN the thiochrome method for the estimation of vitamin B<sub>1</sub> (thiamine), iso-butyl alcohol is employed to extract the thiochrome formed from thiamine by oxidation with alkaline ferri-cyanide. Some difficulties in obtaining supplies of iso-butyl alcohol emphasised the need for a substitute. But no references are available in the literature about any other solvent being used in the place of iso-butyl alcohol for extraction of thiochrome. Preliminary trials with some common laboratory solvents showed that iso-amyl alcohol could be useful. Supplies of iso-amyl alcohol are easier to obtain and its use is more economical because it is cheaper and the recovery of used solvent is higher due to its much lower solubility in water. These points indicated the promising use of iso-amyl alcohol, and further experiments were carried out to establish its utility. For purposes of comparison, iso-amyl and iso-butyl alcohol were used in the estimation of vitamin B<sub>1</sub> on two aliquots of the same extract of each biological material obtained by employing a modified method of Swaminathan (1942). The relevant results obtained with various types of biological material are given in Table I.

These results show that the amount of vitamin B<sub>1</sub> and the recovery of added vitamin are comparable with both the alcohols. The intensity of fluorescence was similar in all cases. It was found that the values for blanks with iso-amyl alcohol were in general lower than those obtained with iso-butyl alcohol, indicating that iso-amyl alcohol extracts interfering fluorescent materials to a lesser extent than iso-butyl alcohol. A study of the effect of the duration of shaking showed that all the extractable thiochrome was removed in one minute and there was no destruction even upto three minutes' shaking. Thus, thiochrome in iso-amyl alcohol is more stable than in iso-butyl alcohol since Conner and Straub (1941) have shown that the duration of shaking with iso-butyl alcohol should not exceed two

TABLE I

Name of the Biological material	Iso-butyl alcohol		Iso-amyl alcohol	
	Vitamin B <sub>1</sub> $\mu$ g./g.	Recovery of added vitamin per cent.	Vitamin B <sub>1</sub> $\mu$ g./g.	Recovery of added vitamin per cent.
<i>Cereals:</i>				
1. Wheat, whole	4.4	94	4.3	96
2. Rice, raw milled	1.4	91	1.5	95
<i>Pulses:</i>				
3. Bengal gram	5.0	95	4.8	95
4. Red gram	1.2	88	1.1	87
5. Soya bean	1.3	95	1.3	93
<i>Nuts:</i>				
6. Groundnut	9.2	93	9.3	96
<i>Vegetables:</i>				
7. Carrot	0.53	94	0.58	96
8. Cabbage	0.67	88	0.69	90
<i>Animal tissue:</i>				
9. Liver, sheep	3.1	88	3.4	89
<i>Yeasts:</i>				
10. Yeast, brewer's, dried	50.0	100	48.1	96
11. Yeast extract	17.1	95	18.0	93

minutes as there was some lowering in the intensity of fluorescence on shaking for three minutes. Hence iso-butyl alcohol can be substituted with advantage by iso-amyl alcohol in the extraction of thiochrome from reaction mixtures for the chemical estimation of vitamin B<sub>1</sub>.

Nutrition Research Laboratories,  
Indian Research Fund Association,  
Coonoor,  
April 17, 1943.

K. K. P. NARASINGA RAO.

1. Conner, R. T., and Straub, G. J., *Ind. Eng. Chem., Anal. Ed.*, 1941, **13**, p. 380. 2. Swaminathan, M., *Ind. Jour. Med. Res.*, 1942, **30**, 263.

### THE ADRENALINE AND ASCORBIC ACID CONTENTS OF THE SUPRARENAL GLANDS OF SLAUGHTERED ANIMALS

THE quantitative estimation of Adrenaline in the suprarenal glands of slaughtered animals is of considerable significance at the present time in view of the large-scale production of this hormone which is now being attempted by several firms in India. Neither the chemical nor the biological methods of estimation are entirely free from criticism. Among the chemical methods (colorimetric) the most popular has been that originally worked out by Folin which, however, is extremely unspecific for the compound: the more accurate seems to be the persulphate colour reaction, which was worked out into a quantitative method by Barker,<sup>2</sup> using the tintometer. In the present investigation both the Folin and Persulphate methods (the latter with modifications to suit estimations with the Dubosq colorimeter) were employed. Since ascorbic acid is intimately