

We have investigated this colour test with all the substances, except hydantoin, which could be present in the hydrolysis product from glycine, under the following conditions:

Aqueous solution ...	NH ₄ Cl	NH ₃ MeCl	Glycine	NaHCO ₃	NH ₃	NH ₄ Cl with NaHCO ₃	NH ₃ MeCl with NaHCO ₃	Glycine with NaHCO ₃
Rimini test	-	-	-	-	+	+	+	+

We think that further comment is unnecessary.

EXPERIMENTAL.

4-p-Sulphamylbenzylhydantoin.—*p*-Sulphamylphenylalanine hydrochloride (2 g.) in water (20 c.c.) was made faintly alkaline with dilute sodium hydroxide, urea (1 g.) added, and the solution refluxed for 3 hours. The cooled solution was acidified with dilute hydrochloric acid and evaporation on the steam-bath. The crystalline *hydantoin* was collected, washed with a little cold water, and air dried; yield 1.4 g. (68%), m. p. 206—207° (decomp.) (Found: C, 41.6; H, 4.5; N, 14.3. C₁₀H₁₁O₄N₃S₂H₂O requires C, 41.8; H, 4.5; N, 14.6%).

4-p-Methylsulphonylbenzylhydantoin.—A mixture of *p*-methylsulphonylphenylalanine (1 g.), barium hydroxide octahydrate (0.4 g.), and urea (0.5 g.) in water (40 c.c.) was boiled gently for 3 hours, filtered whilst still hot, and the filtrate acidified with hydrochloric acid. Evaporation gave crystals of the *hydantoin* which separated from aqueous acetic acid (1:1 by volume) in colourless fine prisms, m. p. 214° (decomp.) (Found: C, 49.2; H, 4.5. C₁₁H₁₂O₄N₂S requires C, 49.2; H, 4.5%; yield 0.9 g. (84%).

4-p-Phenylsulphonylbenzylhydantoin, m. p. 226—228° (decomp.) from aqueous acetic acid (Found: C, 57.7; H, 4.5. C₁₆H₁₄O₄N₂S requires C, 58.1; H, 4.3%), was similarly prepared in 74% yield from *p*-phenylsulphonylphenylalanine.

4-4'-p-Chlorophenylsulphonylbenzylhydantoin, m. p. 228—229° (decomp.) from acetic acid (Found: C, 50.4; H, 3.9. C₁₆H₁₃O₄N₂ClS₂H₂O requires C, 50.2; H, 3.9%), was similarly obtained in 83% yield. It is possible that this compound and the sulphamyl analogue are the corresponding ureido-acids since the analytical data indicate 1 molecule of water of crystallisation in each case.

Hydrolysis of 4-p-Methylsulphonylbenzylhydantoin.—(a) The *hydantoin* (0.8 g.; 0.003 mol.) and barium hydroxide octahydrate A.R. (2.14 g.; 0.0068 mol.) in water (20 c.c.) were refluxed for 16 hours in a ground-glass apparatus with a soda-lime guard tube. The precipitate which separated was filtered off and washed repeatedly with boiling water, and the barium ion in the filtrate determined as sulphate (Found: 0.8 g.; 0.0034 mol.) by precipitation with dilute sulphuric acid. Concentration of the acidic filtrate and subsequent neutralisation with dilute aqueous ammonia gave a solid (0.6 g.), m. p. 266°, raised to 270° (decomp.) by crystallisation from water, and unaffected by admixture with the original amino-acid.

(b) The *hydantoin* (0.5 g.) was refluxed with concentrated hydrochloric acid (10 c.c.) for 16 hours, the resulting solution evaporated to dryness, and the residue dissolved in the minimum amount of water. Neutralisation with ammonia gave the original amino-acid, m. p. and mixed m. p. 270° (decomp.).

Hydrolysis of 4-4'-p-Chlorophenylsulphonylbenzylhydantoin.—(a) The *hydantoin* was recovered unchanged after 18 hours' treatment with boiling 30% sulphuric acid.

(b) Hydrolysis of the *hydantoin* (0.5 g.) with boiling 2% sodium hydroxide (10 c.c.) for 40 hours or 10% sodium hydroxide (10 c.c.) for 18 hours gave, on acidification with acetic acid, the original amino-acid, m. p. and mixed m. p. 258° (decomp.) after crystallisation from alcohol.

Attempted Preparation of Methylamine from Glycine.—Following Wada's method (*loc. cit.*), glycine (5 g.), urea (5 g.), and 0.4N-barium hydroxide (25 c.c.) were refluxed for 3 hours. The solution was then acidified with sulphuric acid, filtered, and the filtrate evaporated almost to dryness. The residue was refluxed with concentrated hydrochloric acid (25 c.c.) for 16 hours. The cooled solution deposited ammonium chloride (4 g.) which was identified by (i) liberation of ammonia, etc., (ii) analysis of the ammonium chloroplatinate. The filtrate was evaporated to dryness and the residue extracted with hot absolute alcohol. The cooled alcoholic extract deposited needles of impure glycine hydrochloride, m. p. 160—170° (which could not be improved, probably because of a trace of admixed ammonium chloride), which were acidic to methyl-orange and when made alkaline with sodium hydroxide gave only a faint ammoniacal odour. Methylamine could not be detected either as the hydrochloride (m. p. 226°) or picrate.

Attempted Decarboxylation of Tyrosine.—L-Tyrosine (decomp. 325—326°) (2 g.), urea (1 g.), and barium hydroxide octahydrate (0.2 g.) in water (100 c.c.) were refluxed for 2 hours, filtered hot, and the filtrate acidified with hydrochloric acid. Evaporation then gave the *hydantoin*, m. p. 264°. This was recovered unchanged after 3 hours' boiling with 2% sodium hydroxide, but 16 hours' boiling with concentrated hydrochloric acid regenerated tyrosine, decomp. 325—326°.

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