From the heats of formation, an enthalpy change of 10 kcal. is predicted for the reaction

$$CrI_3(c) = CrI_2(c) + {}^1/_2I_2(c) \qquad (3)$$

3 kcal. less than previously estimated by extrapolation of thermal dissociation equilibrium data at 570°.[5] The heat of reaction (3) at 25° has been determined by comparison of the heats of solution of CrI_3 and CrI_2 with excess solid iodine in 750 ml. of 0.02 *N* HCl solution. Known mixtures of CrI_3 and CrI_2 were dissolved and iodine was subsequently introduced. The heat of solution of pure CrI_2 was determined under similar conditions and the contribution of each component in the mixtures calculated. Inasmuch as iodine readily oxidizes chromium(II) to chromium(III), the final state of chromium after dissolving CrI_2 is the same as that with CrI_3. The results for the mixtures are somewhat less consistent than those for the pure substances; however, the difference between the mean values, 11 kcal. (Table I), agrees with the predicted result within experimental uncertainty.

Experimental Procedure

A description of the simple adiabatic calorimeter and its operation[6] and the preparation of CrI_3[7] have been given previously. Heats of solution were measured at 25 ± 1°. CrI_2 was prepared by thermal decomposition of CrI_3 in vacuum (400–500°), followed by sublimation in vacuum at 700°. The chromium chlorides were also purified by sublimation. The composition of these substances was checked by analysis; deviation from theoretical values did not exceed 0.5%. Samples were introduced into the calorimeter in sealed thin glass capsules, previously filled in a dry-box.

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DEPARTMENT OF CHEMISTRY
UNIVERSITY OF WASHINGTON
SEATTLE 5, WASHINGTON

The Stability of Hydroxystreptomycin

BY IRVING R. HOOPER AND MURRAY A. KAPLAN

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An unknown antibiotic isolated in the antibiotic screening program carried out at these laboratories was found to be identical with hydroxystreptomycin.[1–4] In the course of our degradation studies, it was found remarkably resistant to hydrolytic inactivation, compared to streptomycin.[5]

The stability of hydroxystreptomycin in water and methanol solutions is shown in Table I. Solutions initially contained 10 mg./ml. of hydroxystreptomycin base and were followed by bioassays.

TABLE I

Solvent	*p*H	Time, days	Temp., °C.	Activity remaining, %
Water	2	8	20	>95
Water	6.5	8	20	>95
Water	12	8	20	>95
Water	2	1	100	56
Water	6.5	1	100	58
Methanol	2	4	65	72
Methanol	6.5	1	65	83

Hydroxystreptomycin is much more stable to acid hydrolysis under mild conditions than is streptomycin. Table II shows the results obtained from stability studies on streptomycin and hydroxystreptomycin in 2 *N* hydrochloric acid at 20°. Initial concentrations were 4 mg. of antibiotic base/ml. The figures are taken from the best line fitted to the plot of the logarithm of concentration against time.

TABLE II

	Activity remaining, %			
	1 day	2 days	7 days	21 days
Streptomycin	50	19	<1	
Hydroxystreptomycin	93	85	58	20

The hydrogenated derivatives are very similar to the unreduced compounds with respect to stability in hydrochloric acid.

RESEARCH DIVISION
BRISTOL LABORATORIES, INC.
SYRACUSE 1, NEW YORK

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The Reaction of Esters with Phenylhydrazine in the Presence of Phosphoric Acid[1]

BY T. O. JONES, R. E. HALTER AND W. L. MYERS

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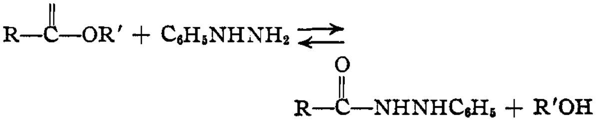
The reactions of esters with ammonia, hydroxylamine and hydrazine to produce the corresponding amide, hydroxamic acid or hydrazide are well known. Cohn[2] and Meyer[3] reported a reaction between methyl salicylate and phenylhydrazine to produce the corresponding phenylhydrazide, and Baidakowski, Reformatski and Slepak[4] prepared a few phenylhydrazides by heating the ester and phenylhydrazine in a sealed tube at 210°, but no other examples of this reaction have since been reported.

Various modifications and adaptations of earlier procedures for carrying out similar reactions were tried for the reaction



$$R{-}\overset{\displaystyle O}{\overset{\|}{C}}{-}OR' + C_6H_5NHNH_2 \rightleftharpoons R{-}\overset{\displaystyle O}{\overset{\|}{C}}{-}NHNHC_6H_5 + R'OH$$

using the ester and the free base in various solvents or using the ester and the hydrochloride or sulfate salts, all without results. It was noted that when the phenylhydrazine salts were used, they remained unchanged during the trials so the phenylhydrazine

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