58, 535 (1936)] that while there is no exchange between radioactive iodine and ethyl iodide when heated together for fifteen minutes at 87°, as determined by the subsequent measurement of the activities of the two substances, yet in alcoholic solution at 100° a ready exchange takes place between sodium iodide and ethyl iodide. Further experiments on this latter reaction have shown the existence of a marked temperature effect.

The general procedure in these experiments has been as follows: A solution of 50 micromoles of iodine in a liter of iodobenzene is irradiated with the neutrons from a Rn–Be source for a period of one and one-half hours or longer. After removal of the neutron source, the iodine is extracted and precipitated as silver iodide, which is then transformed into dry sodium radioiodide. This is dissolved in 1–2 cc. of ethyl alcohol and mixed with 100 micro-moles of inactive ethyl iodide. This mixture is heated to the desired temperature for a stated interval of time and then quickly cooled. (In the one experiment carried out below room temperature both solutions were cooled before being mixed.) The two iodides are separated by shaking the solution with excess ether and water, and are transformed into silver iodide for measurement. The activity of each precipitate is measured by means of a tube counter. The results obtained in a series of experiments at different temperatures are given in tabular form.

Temp., °C.	Time, min.	Exchange
100	5	Complete
100	1	Complete
80	5	Complete
29	5	Partial
29	1	None
24	5	None
19	5	None

The authors are grateful to Dr. K. W. Stenstrom of the University Hospital for the gift of 150 millicuries of radon, and to Dr. J. H. Williams of the Department of Physics for the use of a low resistance amplifier [of the type described by Neher and Harper, *Phys. Rev.*, **49**, 940 (1936)], without which it would not have been possible to carry on this work during the recent hot weather.

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RECEIVED AUGUST 22, 1936

THE PHOTOCHEMICAL DECOMPOSITION OF METHANE

Sir:

Methane at atmospheric pressure is photochemically decomposed when irradiated with the light which is transmitted by a thin fluorite window from a hydrogen discharge tube. The effective radiation would appear to lie near the limit of transmission of fluorite. Although no direct measurements of quantum yield have been made, a crude estimate based on a comparison with the rate of the ozone synthesis in the same cell indicates a value of the order of unity.

Among the products we have identified hydrogen and unsaturated hydrocarbons (probably ethylene) in the approximate molecular ratio of 4:1. Higher saturated hydrocarbons may also be produced but have not been detected. The large ratio of hydrogen to unsaturation in the products indicates that the decomposition

$$CH_4 + h\nu \longrightarrow CH_2 + H_2$$
$$2CH_2 \longrightarrow C_2H_4$$

cannot be the only process involved.

DEPARTMENT OF CHEMISTRY
STANFORD UNIVERSITY, CALIF.
PHILIP A. LEIGHTON
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RECEIVED JULY 28, 1936

NEW SYNTHESIS OF GLYCOFURANOSIDES

Sir:

In the last decade considerable progress in sugar chemistry had been made from the study of the glycopyranosides. Further developments can likely be expected from a greater than our present knowledge of the glycofuranosides, or, as E. Fischer originally named them, γ-glycosides. The physical, chemical and biological properties, the conversion into the pyranosides under certain conditions, and the chemical structure in general, of these γ-glycosides should be thoroughly investigated. To be sure, such studies have already been made in the past, in a few isolated instances. However, a review of the literature reveals that only five or six γ-glycosides are known in pure crystalline form obtained mostly in small yields by cumbersome methods. The majority of the γ-glycosides described in the literature were prepared by the original method of E. Fischer [*Ber.*, **28**, 1145 (1895); **47**, 1980 (1914)] yielding only sirupy mixtures that could not be separated. Obviously, a general method which leads to well-defined, crystalline products,