decolorize bromine water. The liquid air condensate is mostly carbon tetrachloride and hydrogen chloride. Tests for chloroform and for phosgene were negative. A brown oily residue remained after distillation of the carbon tetrachloride.

The most striking result, however, is the presence in the condensate of a small amount of a volatile substance, which explodes on coming in contact with the air. If, at the conclusion of a run, the contents of the trap are rapidly melted in air, the boiling off of the hydrogen chloride is attended by small repeated explosions. In some of the runs the condensate was covered with water immediately upon removal of the liquid air. Upon warming, the hydrogen chloride passed into the water layer and the explosive substance remained in solution in the carbon tetrachloride. This was evidenced by the fact that the first few drops of distillate from the latter layer exploded on forming in the condenser. These explosions were accompanied by the deposition of a considerable amount of soot.

It seems most plausible to assume that the initial reaction is $CCl_4 + H = CCl_3 + HCl$. The solid product is evidently formed by the association of the CCl_3 fragments and subsequent dechlorination by atomic hydrogen, the removal of chlorine being followed by polymerization. The dechlorination must take place, at least in part, after the material has condensed on the walls. The explosive substance has not been identified. Professor Kohler has pointed out that it might be either mono- or dichloroacetylene. The work will be continued with the objects of establishing the identity of this substance and of deducing the mechanism of its formation.

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THE FORMATION OF METHYL RADICALS IN THE DECOMPOSITION OF AZOMETHANE

Sir:

The formation of the observed products in the homogeneous thermal decompositions of the two unsymmetrical azo compounds, methylisopropyl diimide and dimethyltriazene, is best explained by the assumption that the azo compounds liberate radicals on decomposition and that these radicals later combine at random. In some recently completed work which concerned itself with the possibility that short reaction chains accompany the unimolecular decomposition of azomethane, it was assumed that methyl radicals were formed in that decomposition. In order to avoid ambiguity in the conclusions drawn from the experiments, it was thought advisable to obtain more direct evidence that methyl radicals are actually liberated when azomethane decomposes.

Azomethane was decomposed in an apparatus similar to that described by Rice, Johnston and Evering [THIS JOURNAL, **54**, 3529 (1932)] in which water vapor served as a carrier gas, and the decomposition products were allowed to pass over cold lead mirrors. It was found that the products readily removed the mirrors when the temperature of the furnace was above 475° and that removals could be observed when the mirrors were as far as 10 cm. from the furnace.

These facts indicate very strongly that methyl radicals are formed when azomethane decomposes thermally. Ramsperger found that from 275 to 330° the products of the decomposition were independent of temperature. It is not absolutely certain that the products at 475° would be the same as those at 330°, but it is probable that they would be so if no explosion of the gas occurred. No explosions were observed to have taken place in the experiments here reported.

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SOME FURTHER REMARKS ON THE USE OF THE MAGNETO-OPTIC METHOD

Sir:

Allison and Murphy [THIS JOURNAL, **52**, 3769 (1930)] presented their very important work on the magneto-optic apparatus. Since that time several other papers have come from their laboratory giving further data on the use of this apparatus. Their results have been so astounding that many chemists, physicists and other scientists have been a little hesitant in accepting this work and have also failed to see its wide application and use in the field of science, especially in the field of chemistry and biochemistry. Due to this feeling of skepticism, and to our interest in the method, we decided to apply it in the study of the localization of some metals in the organs and tissues of animals.

We believe, therefore, that the experience which we have had in the application of this method to the analysis of solutions of uranium nitrate will be of general interest.

Following the procedure of Bishop and Dollins [THIS JOURNAL, **54**, 4585 (1932)] we determined the concentration at which the characteristic minimum of the most abundant isotope of uranium appeared on progressive concentrations and that at which it disappeared on progressive dilutions. In a total of 126 analyses, many of which were checked by two different observers, readings could be repeated within 3 mm., corresponding to 0.02 division of the magneto-optic scale, and the results as obtained lead us to believe that the method is accurate by very careful manipulation to within ±10%. However, one must observe all the precautions outlined in the