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Nitrogen Trichloride and Grignard Reagents

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them with certain desirable physiological properties. With this in mind a series of Grignard reagents is being prepared, the members of which contain the $-MgX$ group attached to carbon in a molecule having a basic group like $-NR_2$ or in a substituted pyridine, quinoline, etc., grouping. Such $RMgX$ compounds are formed from the corresponding RX compounds with somewhat less ease than from RX compounds having no basic grouping; however, they appear to have the same general properties of $RMgX$ compounds not containing the amino or substituted amino groups.

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NITROGEN TRICHLORIDE AND GRIGNARD REAGENTS

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Nitrogen trichloride reacts with Grignard reagents to produce primary amines, ammonia, and a small amount of secondary amines. No tertiary amine was isolated. The percentage yield of these products obtained in a typical reaction with *n*-butyl magnesium chloride were as follows: *n*-butyl amine 35%, ammonia 15%, and di-*n*-butyl amine 3%.

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ORGANIC MATTER AND THE LIFE OF THE GREEN PLANT

NORMAN ASHWELL CLARK

Along with the development of the conception of vitamins for animals there was introduced the corresponding idea of the necessity of unknown organic substances for plants. These accessory substances, termed auximones, were claimed to be essential for the growth and development of all chlorophyll producing plants. By the use of *Lemna major* it was found at Iowa State College that this claim was not valid, and that these plants would grow and reproduce successfully in a medium composed of highly purified inorganic salts. The presence of organic matter, however, stimulated the reproduction, and the effect of organic substances has been investi-