

Short Communications

Plant Growth Substances of the
Cinnamic Acid Type

MAGNUS MATELL

*Department of Organic Chemistry, Royal
Agricultural College, Uppsala, Sweden*

As an extension of previous work on plant growth substances¹ a number of *trans*-cinnamic acids have been synthesized. Melting points and analytical data of these compounds are given in Table 1. Several of these acids have already been described in the literature but are reported here too as in some cases the experimental conditions were modified. In other cases new modifications or melting points, differing from those previously reported, were found. The experimental details will be given in a later communication.

The plant physiological properties of the compounds listed in Table 1 are now studied by Dr. Börje Åberg, who will publish his results in a separate paper. It may, however, already be mentioned that the well-known anti-auxin effect of *trans*-cinnamic acid is increased when chlorine is introduced into the aromatic nucleus.

This investigation of cinnamic acids as plant growth substances is also planned to comprise the *cis*-forms. The conditions for the preparation of *cis* isomers by ultraviolet irradiation of *trans* isomers are now

under investigation as well as methods for the separation of the *cis* compounds from the reaction products.

Hydrocinnamic acids derived from the chlorocinnamic acids mentioned above should also be of some interest from a plant physiological point of view. As the chlorocinnamic acids are already available it should be advantageous if the hydrocinnamic acids could be prepared by reduction or hydrogenation. To avoid the simultaneous elimination of chlorine the experimental conditions must be properly chosen. Experiments are in progress with this object in view.

From a stereochemical point of view the α -methylhydrocinnamic acids attract particular interest due to the asymmetric α -carbon atom. It would be interesting to investigate the plant growth regulating properties of the optically active forms especially if it is possible to connect them sterically to the enantiomorphic α -aryl-oxyalkylcarboxylic acids which have previously been shown to possess stereochemical specificity as plant growth regulators^{1,2}.

This work is supported by the *Swedish Natural Science Research Council*.

1. Matell, M. *Ann. Agr. Coll. Swed.* **20** (1953) 205.
2. Åberg, B. *Ibid.* **20** (1953) 241.

Received March 26, 1955.

Table 1. Melting points (M. p.) and equivalent weights (Eq. wt.) of cinnamic acids.

Cinnamic acid	M. p. °C	Eq.wt.calc	Eq.wt.found
2-Chloro-	209—210	182.6	182.8
3- »	163—164.5	182.6	182.8
4- »	248—250	182.6	183.9
2,4-Dichloro-	232—234	217.1	217.9
3,4-	218—219	217.1	218.3
α -Methyl-2-chloro-	108—109.5	196.6	197.8
» 3- »	105.5—107	196.6	198.3
» 4- »	166—167	196.6	197.2
» 2,4-dichloro-	143—145.5	231.1	232.7
» 3,4- »	150—152	231.1	230.2