Absolute Configuration of Linderalactone and Linderane

By KEN'ICHI TAKEDA,* ISAO HORIBE, MIDORI TERAOKA (née MIJAWAKI), and HITOSHI MINATO
(*Shionogi Research Laboratory, Shionogi & Co., Ltd., Fukushima-ku, Osaka, Japan*)

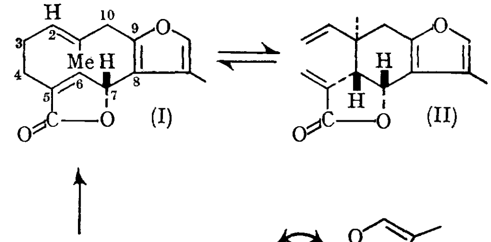
THE absolute configuration of isolinderalactone (II),[1] one component of the root of *Lindera strychnifolia* Vill., has already been published.[2] We now report the stereochemistry of the related compounds, linderalactone (I)[1] and linderane (III),[3] which are components of the same plant.

Linderalactone (I), m.p. 136—138°, $[\alpha]_D + 117°$, was easily isomerised to isolinderalactone (II) by a Cope rearrangement,[1] thus establishing that the hydrogen on the carbon carrying the lactonic oxygen has the same absolute configuration (the β-configuration) as that of isolinderalactone. A new furan sesquiterpene, neolinderalactone (IV), m.p. 116—118°, $[\alpha]_D + 100°$, was also isolated from the same plant (Chinese origin) and its structure will be discussed.[4]

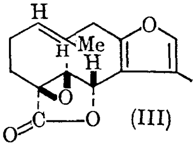
In order to clarify the isomerism of the double bonds in (I) and (IV), the nuclear Overhauser effect method[5] was applied to these compounds. Irradiation of the methyl group at C-1 in (IV) causes an increase of 12·5% in the intensity of the vinyl proton signal at C-2, whereas irradiation of the same methyl in (I) causes no increase at all (see Table).

This result leads to the conclusion that the methyl at C-1 and the H at C-2 are in a *cis*-relationship in (IV) and a *trans*-relationship in (I). The absolute configuration of linderalactone should therefore be represented by the formula (I).

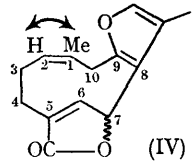
Linderane (III),[3] m.p. 190—191°, $[\alpha]_D + 180°$, was converted into linderalactone (I) by the action of chromous chloride.[6] As shown in the Table, the n.m.r. spectrum reveals the proton signals on C-6 and C-7 at τ 6·07 and 4·70 as singlets. There is therefore no coupling between the protons at C-6 and C-7, and the dihedral angle between those protons is *ca.* 90°. Only the structure having the hydrogen on C-6 in the α-configuration satisfies such stereochemistry, and the absolute configuration of linderane is therefore represented by the formula (III).



(I) (II)



(III)



(IV)

Chemical shifts (τ)

	(I)	(IV)	(III)
Me at C-1	8·72	8·40	8·43
Me on furan ring	7·90	7·94	8·00
	(d., *J* 1·1)	(d., *J* 1·3)	(d., *J* 1·1 c./sec.)
H at C-2	5·05	4·85	4·63
	(t., *J* 7·5)	(t., *J* 7·6)	(d., *J* 9·0 c./sec.)
H at C-7	4·17	4·27	4·70 (s.)
H at C-6	3·18	3·20	6·07 (s.)
H on furan ring	2·87	2·93	2·87
	(q., *J* 1·1)	(q., *J* 1·3)	(q., *J* 1·1 c./sec.)

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