not very different for different positions in toluene.

Experiments of the same kind are planned for other benzene derivatives, among which are those containing a bulky alkyl group causing a possible steric hindrance. Homogeneous exchange mixtures should be used in order to enable comparisons between the exchange rates of different kinds of molecules, especially for relating other rates to that of unsubstituted benzene. Experiments with deuterium as tracer are also planned in order to reveal the influence of isotopic mass on the absolute magnitude of the exchange rates and if possible to find differences in isotope effect between different aromatic positions.

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Isolation of α -Methoxy- $\Delta^{\alpha,\beta}$ -butenolide from *Narthecium ossifragum* (L.) Huds.

ARNULV STABURSVIK*

Institutt for organisk kjemi, Norges Tekniske Høgskole, Trondheim, Norway

A new unsaturated γ -lactone has been isolated from a methanolic extract of the flowering parts of *Narthecium ossifragum*. After removal of carotenoids and accompanying substances, *i.e.* 22-hydroxy-cholesterol¹, by dilution with water and subsequent extraction with petroleum ether, the diluted methanolic extract was evaporated under reduced pressure. From the residual concentrated aqueous solution further impurities were removed by extrac-

tion with ether. The lactone could then easily be extracted with chloroform, and, on spontaneous evaporation formed large crystals, which after purification melted at 57° C. (Found: C 52.4; H 5.25. Calc. for $C_6H_8O_3$: C 52.6; H 5.30). *M* (by titration) 114. Calc. 114. $[\alpha]_D^{20} \pm 0^\circ$. The substance contained one methoxyl group; it failed to give an acetyl derivative. The I.R. spectrum indicated a γ -lactone and an $-O-C=CH-$ grouping². The U.V.-spectrum showed a maximum at 224 m μ , $\log \epsilon$ 3.88, indicating an α,β -unsaturated lactone, this structure also being supported by the modified Legal reaction of Paist *et al.*³

The most likely structure for the lactone would be α -methoxy- $\Delta^{\alpha,\beta}$ -butenolide or β -methoxy- $\Delta^{\alpha,\beta}$ -butenolide. As the previously known β -methoxy compound⁴ could be excluded because of its higher m.p. (67°), the synthesis of the α -methoxy compound was attempted.

α -Ketoparaconic acid ethyl ester was prepared by the method of Fischhof⁵ and decarboxylated according to Schinz and Hinder⁶. The resulting crude ethereal extract, containing α -keto-butyrolactone, was methylated with diazomethane. The oily reaction product on sublimation (100°, 10 mm), crystallisation from ether and resublimation furnished colourless prisms which melted at 57°, undepressed by the natural substance. The I.R. spectra (in chloroform solution) were identical, thus confirming the identity of the two substances. This lactone is stable and forms a striking contrast to α -methoxy- β -methyl- $\Delta^{\alpha,\beta}$ -butenolide, which according to⁶ liquefies in two months.

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* Research fellow of Norges Almenvitenskapelige Forskningsråd.