

ABSTRACTS

Pilot Plant Test for the Continuous Preparation of Polyethylene

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Polyethylene was prepared in a pilot plant (10 kg. polyethylene per day) continuously polymerizing ethylene with 0.0020-0.050 % oxygen at the pressure of 1000-1350 atm. and the temperature of 150-230°C.

Hangins' constants (k') of the polyethylenes obtained were determined and correlated to the conditions of preparation.

The results showed that the increase in the oxygen content in ethylene and the rise of temperature as well as pressure increased the degree of branching of the obtained polyethylene.

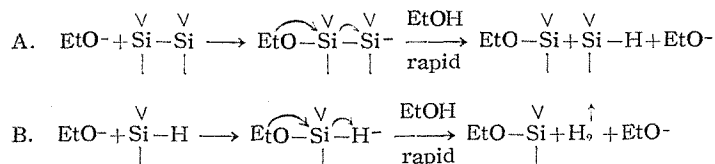
(Read at the semi-annual meeting of the Institute on June 12, 1954)

On the Decomposition Rate of Si-Si Bond in Disilane by NaOC_2H_5

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The rates of cleavage of some methylethoxydisilanes by NaOC_2H_5 in ethylalcohol were measured and the following reaction mechanism was proposed, in which process A is the rate determining step.



The reaction rates were followed by volumetrical measurements of hydrogen evolved at suitable time intervals.

The physical constants and analytical data of the disilanes used and kinetical data, that is, the second order rate constants (first order with respect to disilane and also to NaOEt), the activation energies E and the frequency factors A , are lumped in the next Table.

ABSTRACTS

	$\begin{array}{c} \text{Me}_2 > \text{Si} - \text{Si} - \text{Me} \\ \quad \wedge \\ (\text{EtO})(\text{EtO})_2 \end{array}$	$\begin{array}{c} \text{Me} - \text{Si} - \text{Si} - \text{Me} \\ \wedge \quad \wedge \\ (\text{EtO})_2 (\text{EtO})_2 \end{array}$	$\begin{array}{c} \text{Me} - \text{Si} - \text{Si} \\ \wedge \quad \parallel \\ (\text{EtO})_2 (\text{EtO})_3 \end{array}$	$\begin{array}{c} \text{Me}_2 > \text{Si} - \text{H} \\ \\ (\text{EtO}) \end{array}$
bp°C (mmHg)	73 (13)	104 (24)	147 (24)	53~55(760)
d_4^{20}	0.8891	0.9222	0.9447	0.7536
n_D^{20}	1.4205	1.4174	1.4164	1.3670
MR _D Calc.	67.24	72.63	78.03	31.30
MR _D Obs.	67.4	72.66	78.23	31.04
Si % Calc.	23.73	21.07	18.94	—
Si % Obs.	23.9	20.92	18.33	—
Si-Si% (H ₂ evolved)	99	99	98	96
k 30°C 1/mol. sec	4.83×10^{-4}	10.7×10^{-5}	4.07×10^{-3}	19.2×10^{-3}
E Kcal/mol	16.3	12.8	15.4	12.1
log A (1/mol. sec)	8.4	7.3	9.6	7.0

(Read at the semi-annual meeting of the Institute on June 12, 1954)

Infrared Spectra of Sugars and Glucosides

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F. M. Berger and W. Bradley synthesized a large number of Glycerol ethers, of which 3-(2'-Methylphenoxy) propane-1,2-diol has been used as myostatic anesthetic under the trade name of Myanesin. The authors followed the similar procedure with glucosides instead of glycerol ethers and prepared various pairs of α, β -phenolic glucosides in order to compare their physiological actions (*J. Pharm. Soc. Japan*, **72**, 13 (1952); *ibid.* **73**, 402 (1953)). Since February 1953 the authors have carried out the research on the infrared absorption spectra of the α, β -pair of D-glucose and its glucosides, to investigate whether the infrared absorption spectra of anomeric pairs would reveal differences in each pairs, or whether comparison of them reveal common differences which are universally characteristic.

It is observed that in the $11.5\mu \sim 11.9\mu$ region all the α -isomers of D-glucose and D-glucosides have prominent absorption bands which the corresponding β -isomer have not. Furthermore, the absorption spectra of D-sorbitol and D-mannitol which have no lactol hydroxyl radical do not reveal the absorption in the 11.5μ to 15μ region. Also the absorption spectra of β -D-mannose and α -D-galactose which are considered to have cis-configuration at anomeric carbon reveal the profound absorption at 11.8μ and 11.9μ respectively.

From the above, the authors conclude that the common absorption of the sugars and glucosides in the $11.5\mu \sim 11.9\mu$ region is the characteristic absorption of cis-configuration at anomeric carbon.

(Read at the semi-annual meeting of the Institute on June 12, 1954)