long-spacing region are characteristic of compounds that crystallize in different polymorphic forms. The *n*-heptyl thiolpalmitate also exhibited the presence of two phases in its diffraction pattern. Long spacings calculated for the two phases in each compound have been included in Table I. One long-spacing value of each compound was found to fall in line with those obtained for the higher members of the series. Apparently a portion of these thiolesters had crystallized in the same manner as those of the higher members. The other long-spacing value obtained from the diffraction data of *n*-heptyl thiolpalmitate and thiolstearate was about an angstrom less than that of the expected form of each compound. These values were then compared with the long-spacing value obtained for the single phase of *n*-heptyl thiolmyristate. A plot of these long spacings against the total number of carbon atoms in the molecule yielded a straight line. This indicated that the second phase present in both *n*-heptyl thiolpalmitate and thiolstearate was identical in packing to that of the single phase found for *n*-heptyl thiolmyristate. Apparently thiolesters of long-chain fatty acids containing seven carbon atoms in the S-alkyl chain possess a structure such that each of two modes of packing are equally possible. Thiolesters containing five carbon atoms in the S-alkyl chain (4) did not show any indication of forming more than one crystalline form. This crystalline form corresponded to that found for *n*-heptyl thiolmyristate, which was different from that of the higher members of the series. It appears that a change in packing of the odd esters takes place below a mercaptan chain length of about seven carbon atoms.

The lower members of the even series, namely, *n*-hexyl thiolstearate and thiolpalmitate, yielded a single phase unlike the odd heptyl derivatives previously discussed. The long spacings of the hexyl derivatives were only a few tenths of an angstrom unit less than the values expected by extrapolation of the long spacings of the higher members of the series. This is different from the odd series in which the difference in long spacing because of the change in packing form is relatively large, about an angstrom unit. It should be pointed out that the *n*-hexyl derivatives melt close to room temperature, and special precautions had to be taken in order to obtain their X-ray diffraction pattern, thereby reducing the precision of the determined long-spacing value. Thus it could not be shown with certainty that a change in packing occurred below a mercaptan chain length of eight carbon atoms in the even series.

Summary

X-ray diffraction-powder data are reported for 39 *n*-alkyl thiolesters comprising four different series, namely, lauric, myristic, palmitic, and stearic acids. All individual compounds can be identified and distinguished by the X-ray diffraction data. Compounds containing the same total number of carbon atoms in the molecule have the same long and side spacings but differ in the relative intensities of the various orders of the long spacings. The esters crystallize in tilted monomolecular layers. The long spacing is a function of the total carbon content of the molecule and forms two series, one for the odd members and one for the even members. A change in the structure-type definitely occurs in the odd series on decreasing alkyl chain-length below 9 carbons.

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Report of the Cellulose Yield Committee, 1958-59

THREE SETS OF SAMPLES were sent out during the year 1958–59 to nine different laboratories. The following table gives the average results for the three tests.

The checks between the laboratories during the past year were excellent. Checking out of the samples however should be continued as occasionally some laboratory sends in a bad analysis, which is immediately picked up by running these checks.

Lab. No.	No. of tests	A Linter	B Linter	C Litner	Over-all average for the year
1	3	78.7	75.0	70.2	74.6
2	3	78.6	74.6	69.3	74.1
3	3	78.2	74.2	69.6	74.0
4	3	78.5	74.8	70.1	74.4
5	3	78.5	74.8	70.1	74.4
6	3	78.9	75.1	70.3	74.7
7	3	78.3	74.3	69.5	74.0
9	3	78.2	74.1	68.6	73.6
10	3	78.4	74.6	70.0	74.3
		78.4	74.6	69.7	74.2

It might be interesting to reflect that this committee has been in operation for approximately 22 years without any serious complaint in regard to cellulose yield by customer or seller. This is an excellent record for this method.

No changes are recommended for the method at this time. It is recommended that samples be sent out three times during the next year to check different laboratory equipment.

P. D. CRETIEN
W. S. HUDE
W. J. JOHNSON
R. E. KNIPPLE
T. C. LAW
R. C. POPE
E. H. TENENT
L. N. ROGERS, chairman