



Fig. 3. Diagrams representing probable (I) and some excluded alternate arrangements (II-III) for the fatty acid chains of aluminum di-soaps.

chains connected with each aluminum atom are shown lying side by side. This is the only arrangement

among those shown which is in accord with the observed values for the long x-ray spacings. As in the sodium soaps, the aluminum atoms are arranged in a double row with the double hydrocarbon chains side by side and end to end.

Aluminum distearate produced by precipitation below  $60^\circ\text{C}$ ., followed by extraction with acetone at  $30^\circ\text{C}$ . or below, is referred to in this laboratory as "A<sub>2</sub> type." It is characterized by a long spacing of  $47.4\text{\AA}$  and a single strong side spacing of  $4.26\text{\AA}$ . Comparison with the long spacing described above would lead to a monoclinic angle of  $60^\circ$  for the "A<sub>2</sub> type" of aluminum distearate.

### Summary

The aluminum di-soaps appear to have a crystal structure analogous to the sodium soaps, that is, the metal atoms are arranged in a double layer from which the fatty acid radicals extend in opposite directions, end to end. Hence in the aluminum di-soaps the two acid radicals attached to any aluminum atom lie side by side. Aluminum di-soaps produced by precipitation and extraction at higher temperatures have a monoclinic angle of  $48^\circ$ . Those produced at low temperature and extracted at low temperature have a higher value,  $\beta$ , of  $60^\circ$ .

### REFERENCES

1. McBain, J. W., Bolduan, O. E. A., and Ross, S., *J. Am. Chem. Soc.*, **65**, 1873 (1943); Bolduan, O. E. A., McBain, J. W., and Ross, S., *J. Phys. Chem.*, **47**, 528 (1943).
2. Ross, S., and McBain, J. W., *J. Am. Chem. Soc.*, **68**, 296 (1946).
3. McBain, J. W., Bolduan, O. E. A., and Ross, S., *J. Am. Chem. Soc.*, **65**, 1876 (1943).

## Report of the Spectroscopy Committee

THE Spectroscopy Committee has been but recently organized and as yet is not entirely complete as to personnel. The committee to-date is composed of the following members:

- B. W. Beadle—American Meat Institute, Chicago, Ill.  
Ultraviolet spectra.
- B. F. Daubert—Univ. of Pittsburgh, Pittsburgh, Pa.  
X-ray of fats.
- R. H. Ferguson—Procter and Gamble, Cincinnati, O.  
X-ray of soaps.
- R. T. Milner—Northern Reg. Res. Lab., Peoria, Ill.  
Visible spectra.
- R. T. O'Connor—Southern Reg. Res. Lab., New Orleans, La.  
Emission spectra.
- R. C. Stillman—Procter and Gamble, Cincinnati, O.  
Chairman.

A member familiar with infrared and Raman spectra is still to be appointed.

At the Fall meeting of the Society the Spectroscopy Committee was asked to cooperate with the Thiocyanogen Analysis subcommittee and the Saturated Acids subcommittee of the Fat Analysis Committee in an attempt to correlate results (on fat compositions) determined by the various methods. At the moment, this is the only program before the Spectroscopy Committee. It is expected that other problems will develop as the committee gets into operation.

The work program can be readily divided into several parts, all of which are concerned with the spectrochemical (ultraviolet) analysis of naturally occurring oils.

1. Set up a uniform nomenclature for work on ultraviolet absorption.

2. Investigate various factors in the methods used for spectrochemical analysis, including a study of solvents, gas blanketing during isomerization, temperature of isomerization, calibration of instruments, etc.

3. Arrive at a standard method of calculation of fat compositions.

4. Run careful analyses on

- a. Cottonseed oil
- b. Soybean oil
- c. Linseed oil
- d. Corn oil
- e. Lard
- f. Tallow.

Pure samples of all of these oils have been obtained and will be analyzed by approximately twelve collaborators who are active in this work. These same samples will be distributed to the Thiocyanogen and Solid Acids subcommittees for their work.

5. Attempt to correlate the results of the various committees to see wherein the methods differ.

6. Extend the work at a later date to include pure acids other than natural oils as well as hydrogenated oils and fats.

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| B. W. BEADLE   | R. T. MILNER                |
| B. F. DAUBERT  | R. T. O'CONNOR              |
| R. H. FERGUSON | R. C. STILLMAN,<br>chairman |