

to the changes called forth by oxidation of the fat with hydrogen peroxide. The Hehner number and the saponification number increase simultaneously, and aldehydes are formed. The increase in saponification number may, therefore, be ascribed to the formation of slightly lower homologues of the fatty acids of fresh chicken fat, while the increase in Hehner number is doubtless due to the formation of aldehydes and ketones of high carbon content. These changes in the chicken fat *in situ* are probably produced by the action of enzymes.

During the earlier stages of keeping chickens hard frozen, a simultaneous decrease in both the saponification number and the Hehner number occurs; in explaining this phenomenon, both factors—formation of lower fatty acids and formation of ketones and aldehydes—again must be taken into consideration. The fat probably contains acids which, though insoluble in water, are on the border line between soluble and insoluble; these acids are converted into their lower homologues which are soluble; the Hehner number is thereby decreased, and a tendency is created to increase the saponification number. On the other hand, the higher acids of the fat are oxidized with the formation of aldehydes and ketones, and the saponification number is decreased, as happened in the oxidation of oleic and stearic acids with hydrogen peroxide; this oxidation tends to increase the Hehner number. However, as a resultant of these processes of oxidation, the Hehner number and the saponification number decrease simultaneously. In the course of prolonged freezing the chief role is played by the higher fatty acids, which are oxidized and give rise to an increase in both the saponification number and the Hehner number at the same time, as has been described.

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### NEW BOOKS.

**Electro-Analysis.** By EDGAR F. SMITH. Fifth Edition, Revised and Enlarged, with 46 Illustrations. Philadelphia: Blakiston's Son & Co. Price, \$2.50.

The fourth edition of this book was reviewed in *THIS JOURNAL*, 30, 477. The present edition contains, as new material, reviews of all the important work done on the subject during the past four years; also excellent descriptions of all up-to-date apparatus and methods. The book is to be highly recommended to those interested in electro-analysis.

It would seem advisable in works of this kind to give the size of the exposed electrode surface and the current in amperes or the surface and current density on the electrode in question, because the rate of deposition depends to a large degree on these factors. The voltage drop across the two electrodes depends upon a number of factors that may have little or no bearing on the efficiency of the method, *e. g.*, the distance of the electrodes apart, or the anodic polarization.

E. B. SPEAR.

**Handbuch der Mineralchemie.** Edited by DOELTER, *et al.* Vol. I, Pt. 3, Bogen 21-30. Price, M. 6.50.

The latest issued pages of *Mineralchemie* continue the general subject of the carbonates. Calcium carbonate is concluded, and the carbonates of magnesium and calcium (dolomite), manganese, zinc, ferrous iron, cobalt, nickel, copper and strontium are considered. A few minor species like the hydrates of calcium carbonate are also included. We might raise the question whether it would not be more rational, in a work on mineral chemistry, to classify strontium carbonate with those of calcium and magnesium with which it *chemically* belongs, though in mineralogies it is put in another group. The mineralogies on crystallographic grounds also put aragonite in this later group, but here, fortunately, vital considerations have induced the editors to place aragonite with calcite. The work of Leitmeier, who has written the most of this heft, is especially good. His presentation of the synthetic work on aragonite is clear and logical, and the reader leaves it with a well-defined conception of its relation to calcite and of the prime factors which influence its formation. Coming then to the genesis of aragonite in nature, the author classifies its various occurrences in typical groups, pointing out as far as possible the significance of each in the light of synthetic work, though he does not hesitate to state that some are still inexplicable. The data relating to aragonite are, to be sure, on the whole consistent and readily handled. In dolomite (calcium magnesium carbonate), however, we have a mineral about the formation of which very little is known. Its geological importance has made it the subject of a large amount of investigation though, simple as it is, its synthesis has not been accomplished with certainty. It must have been a thankless task to write a digest of this mass of experimental detail, but Leitmeier has done it with an excellent sense of the significance of experiments and their relative values. Very wisely, the minor species of carbonates are treated very briefly; some of them, with further knowledge, may drop out altogether. The analytical directions of Dittrich deserve a word of commendation. The methods are well known, but they are briefly and very clearly given here. E. T. ALLEN.

**Grundzüge der Dispersoidchemie.** BY PROF. DR. P. P. VON VEIMARN. Th. Steinkopff. Dresden. 1911. pp. 121. Price, M. 4.

"This little book is the result of a series of lectures delivered by the author in April, 1910, at the invitation of the Microbiological Society of the Imperial Institute of Experimental Medicine at St. Petersburg," the present publication being a translation by F. Kleemann from the author's manuscript. The book is divided into an introduction, four chapters, a conclusion, and two appendices. The subject matter is treated under the following headings: 1. The colloidal state as a general characteristic of matter. 2. The chief methods for obtaining any given crystallin

substance in any desired degree of dispersion. 3. The conditions governing the stability of suspensoids and suspensions. 4. The principal properties of suspensides and emulsoids of substances of high molecular weight.

The book is characterized by a very evident careful attention to arrangement and systematization of the subject matter, which enhances its value for the average reader and impresses him with the fact that colloid chemistry is gradually being reduced to a science. Most of the experimental illustrations employed are taken from the numerous and important investigations carried out by the author and his students within the last six years.

On page 37 the definition of "condensation pressure," as *equal to a certain concentration difference* rather than *proportional to it*, is open to criticism. Many chemists will also disagree with the author's rejection of the term "amorphous." Certainly his "proof" (see Appendix I), that certain finely divided substances must *necessarily* consist of submicroscopic crystals because they are transformed into visible crystals by shaking with a suitable solvent, will not be accepted without question. On the other hand he succeeds in making it very probable that in the case of many precipitates, the distinction between "amorphous" and "crystalline" is one of degree rather than of kind.

Altogether the book is a very readable one and bears less resemblance to a descriptive catalogue than do many of the recent treatises on the subject.

EDWARD W. WASHBURN.