

bright-line images of portions of the filament are formed in the field of the instrument, and the intensity is very much greater than that obtainable with the frosted bulb lamp. No doubt other uses may be found for such a lamp in general laboratories.

The lamp is shown in the accompanying figures, and the specifications for it are as follows: Mazda, stereopticon type (concentrated filament), 100-watt, 110-volt, G-30 bulb, unskirted.

A 60-watt lamp has also been made, having a smaller bulb. So far as the writer knows, they have not been made for 220-volt circuits, though two in series could be operated at this voltage, of course.

In laboratories having the proper current, the new nitrogen-filled Mazda lamps will, no doubt, prove useful for the same purposes as the above described stereopticon lamp. This lamp is made in a 100 c. p. size, taking 10 amperes at 6 volts—about 0.6 watt per candle—in a bulb of the same size as the first lamp mentioned, the filament consisting of a single heavy loop; also for 6.6 ampere (street-series) at voltages from 6 to 50.

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### NEW BOOKS.

*L'Etude physico-chimique des Sels chromiques.* PAR A. SÉNÉSCHAL. Nr. 5 des Publications de la Société de Chimie-Physique, pp. 28, 1913. Paris, Librairie Scientifique, A. Hermann et Fils. Price 2 francs.

The differently colored modifications of chromium chloride, nitrate, sulfate, etc., have offered an alluring problem to chemists for more than a century. Little progress was made in their study until Recoura, in 1887, resorted to methods of physico-chemical analysis.

Sénéschal in this short pamphlet reviews the work of Recoura and the physico-chemical investigations which have succeeded it in this field, displaying that lucidity of statement which is so often encountered among French writers. Of these investigations those of Werner have been of the greatest importance. His coördination theory has proven very illuminating when applied to these salts, and has furnished the only satisfactory classification of them; indeed, by its aid, we can deduce the architecture of the green hexahydrate of chromium chloride, in greater detail than is possible with almost any other inorganic compound. Werner's work and the careful measurements of Bjerrum on the rates of transformation of, and on the equilibria between, different modifications of chromium chloride in solution, constitute the principal subject matter of the pamphlet.

Since what the author gives is so well given, we regret that he did not give us more. He has ignored a number of recent investigations specifically

dealing with his field; namely, those of Olie, Weinland and Koch, Graham, Pfeiffer and the most recent investigations of Werner, and others. Indeed, he has not even mentioned these investigations in his bibliography.

ARTHUR B. LAMB.

**L'Additivité des Propriétés Diamagnetiques et son Utilisation dans la Recherche des Constitutions.** By PAUL PASCAL. No. VI des Publications de la Société de Chimie-physique. 8°, 26 pp., 1 franc. Librairie Scientifique, A. Hermann et Fils, Paris, 1913.

In the last few years, the study of organic compounds from the point of view of magnetochemistry has developed so rapidly that its methods now promise to rank as equally important in the physico-chemical investigation of structure as those of spectrochemistry. What Brühl was in the latter field, Pascal, the author of the pamphlet before us, has made himself in the magnetochemical investigation of structure. The pamphlet is a publication of an address given last April before the Société de Chimie-physique in Paris. It presents a lucid, concise and up-to-date survey of the most important of the conclusions arrived at by this brilliant investigator. Organic chemists will be especially interested in the views presented in connection with such old friends in the arena of structure as tautomerism, residual valences, benzene, naphthalene.<sup>1</sup> But all chemists should be interested alike in one of the most important of the modern questions concerning the structure of the molecule, which the electron theory of valence at length promises to put on a definite experimental basis<sup>2</sup>—namely, the question of the influence of neighboring, but not directly linked, atoms and groups on one another: The magnetochemical method of investigation claims to be capable of measuring these effects quantitatively. For instance, it is of interest to note that in alkyl halides there is plainly manifest an attraction between the hydrogen and the halogen atoms attached to neighboring carbon atoms, an attraction so intense as to make the molecule approach decidedly toward the formation of an ethylene group—if indeed the results do not show that in a fraction of the molecules such ethylene groups have been actually formed with liberation of halogen acid.<sup>3</sup>

JULIUS STIEGLITZ.

CHICAGO, Dec. 15, 1913.

<sup>1</sup> The author refers to Claus's and Bamberger's theories but not to that of Armstrong-Baeyer, of which Bamberger's work is an outgrowth.

<sup>2</sup> See, for instance, the simple and instructive application of such views to nitric acid and ammonium hydroxide by W. A. Noyes, *THIS JOURNAL*, 34, 663 (1913).

<sup>3</sup> Chemists unfamiliar with this field but interested in it, will find Wedekind's *Magnetochemie* (Borntraeger, Berlin, 1911) an excellent introduction to it, with ample references to original articles.