NOTES.

The Separation of Gallium from Indium and Zinc by Fractional Crystallization of the Cesium-Gallium Alum.—The separation of gallium and indium by the fractional crystallization of the cesium sulfate alums of these elements has been briefly described by Uhler and Browning,[1] the gallium salt being the less soluble. This reaction was further studied to determine quantitatively the progress of the separation. For this purpose 7.5 g. of the mixed hydroxides of gallium and indium was used. Analysis of the material showed the presence of 26.5 parts of gallium oxide to 73.5 parts of indium oxide. This was dissolved in sulfuric acid and treated with a little more than the theoretical amount of cesium sulfate, the total volume of the solution being 250 cc. Sodium hydroxide was added to neutralize most of the free acid and the solution was then subjected to fractional crystallization. Analysis of a sample of the first crystals showed the ratio of indium oxide to gallium oxide to be 14.9 to 85.1. After 5 fractions had been obtained, the last crystals in each flask were analyzed. The results are given in the table.

TABLE I.—ANALYSES.

Fraction.	Ratio of Ga_2O_3 and In_2O_3 present.	
	Ga_2O_3.	In_2O_3.
1..................................	100.0	0
2..................................	95.3	4.7
3..................................	64.3	35.7
4..................................	23.4	76.6
5..................................	1.9	98.1
6 (Mother liquor)....................	0.6	99.4

The quantitative separation of gallium from zinc by the cesium-alum formation was also tested. To one g. of pure cesium-gallium alum, 0.2 g. of zinc oxide dissolved in sulfuric acid and 0.1 g. of cesium sulfate were added. The solution was allowed to crystallize once, the first sample being analyzed for gallium by ammonium hydrogen sulfite and the zinc in the filtrate by potassium ferrocyanide. The results showed 98 parts of gallium oxide to 2 parts of zinc oxide. Upon recrystallizing the alum no test for zinc was obtained by means of the sodium hydroxide-hydrogen sulfide test.[2]   PHILIP E. BROWNING AND LYMAN E. PORTER.

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Correction.—Owing to a printer's error which was made after the proof had been approved, there are a number of typographical errors in my article, "Statistical Mechanics Applied to Chemical Kinetics," appearing in last month's JOURNAL.[1] On page 2521, the last paragraph should read:

[1] Uhler and Browning, *Am. J. Sci.*, **42**, 389 (1916).
[2] See Browning and Porter, *Am. J. Sci.*, **44**, 221 (1917).

"Examining this equation in the light of Equation 35 itself, it will be found that each of the terms on the right hand side is the average value of some property of the molecules or of the modes of vibration that enter into the reaction; we obtain

$$\frac{d \ln k_1}{dT} = \frac{\bar{\bar{E}}_A - \bar{E}_A + \bar{\bar{E}}_R - \bar{E}_R}{kT^2} \tag{38}$$

where $\bar{\bar{E}}_A$ is the average energy of the molecules which actually enter into the reaction, $\bar{E}_A$ is the average energy of all of the molecules of this kind in the system, $\bar{\bar{E}}_R$ is the average radiant energy of the modes of vibration upon participation in the reaction, and $\bar{E}_R$ is the average radiant energy of such modes of vibration whether or not they are in a reactive condition."

Equation 44 on p. 2524 should read

$$\frac{d \ln k_\nu}{dT} = \frac{\bar{\bar{E}}_A - \bar{E}_A}{kT^2}. \tag{44}$$

Since Equations 38 and 44 for the temperature coefficient, respectively, of thermal reaction rate and photochemical reaction rate were the most important deductions obtained in the article, it seemed necessary to call attention to these corrections.　　　　　　　　　　RICHARD C. TOLMAN.

THE PREPARATION OF RHAMNOSE.

BY C. F. WALTON, JR.

Owing to the lack of a satisfactory method for preparing rhamnose in the laboratory, this methyl pentose sugar has properly been classed as one of the rarer sugars. Rhamnose is formed by the enzymotic or the dilute acid hydrolysis of many of the rhamnosides, among which quercitrin and xanthorhamnin are the best known and most easily obtainable. Xanthorhamnin has been studied by Liebermann and Hörmann,[2] Perkin and Geldard,[3] Tanret,[4] and Votoček and Fric,[5] among other investigators.

Quercitrin, however, has been most often used as a source for rhamnose, as it occurs in the bark of *Quercus coccinea*, var. *tinctoria*, Gray, known commonly as Quercitron, Yellow-barked, or Black Oak, large quantities of which are used in various forms in the tanning and dyeing industries.

[1] THIS JOURNAL, **42**, 2506 (1920).
[2] Liebermann and Hörmann, *Ber.*, **11**, 952 (1878); *Ann. Chem.*, **196**, 299 (1879).
[3] Perkin and Geldard, *Chem. News*, **71**, 240 (1895).
[4] Tanret, *Bull. soc. chim.*, **21**, 1073 (1899).
[5] Votoček and Fric, *Z. Zuckerind. Böhmen*, **25**, 1 (1900).