of these bead tests as applied in qualitative analysis, only that degree of refinement of method was practiced which obtains in careful qualitative analysis.

Solutions of nickel and cobalt nitrates were mixed in varying proportions and the point determined at which either of the metals interfered with the other. The two metals were completely precipitated as sulfides by hydrogen sulfide, in the presence of a sufficient excess of ammonia. Portions of the freshly precipitated sulfides were then fused in the borax beads and the beads, which were of approximately uniform size, were viewed by daylight. All tests were made in duplicate and all the beads were fused in both the oxidizing and reducing flames.

The following results were obtained:

Parts nickel.	Parts cobalt.	Results when held in oxidizing flame.	Results when held in reducing flame.
1	1	Blue bead	Blue bead
2	1	Blue bead	Blue bead
3	1	Blue bead	Blue bead
5	1	Blue bead	Blue bead
7	1	Blue bead	Blue bead
10	1	Blue bead	Blue bead
20	1	Blue bead	Blue bead
30	1	Blue bead	Uncertain violet
40	1	Uncertain brownish	Uncertain brownish
45	1	Uncertain brownish	Uncertain brownish
50	1	Brown bead	Brown bead

The same results as above were also obtained from the hydroxides precipitated from similar solutions by sodium hydroxide.

An examination of the above results indicates that:

One part of cobalt can be detected in the presence of thirty of nickel. If, however, the ratio of the nickel to cobalt be increased, uncertain results are obtained until the ratio is about fifty to one when a decidedly brown bead shows the presence of nickel. Again one part of cobalt in fifty of nickel would certainly be lost if the bead tests were solely relied upon. It is evident, therefore, that the borax bead tests for nickel and cobalt can serve only as confirmatory tests, and that reliance can be placed upon them only when the results are affirmative.

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COLLEGE OF THE CITY OF NEW YORK,
November. 1910.

A Good Substitute for the Platinum Triangle.—While working with an alloy of nickel and chromium in form of a resistance wire manufactured by the Driver-Harris Wire Co., its resistance to the common laboratory fumes and oxidation at the temperature which it is possible to obtain with the ordinary blast lamp, made it occur to the writer that this wire might be used to advantage to replace the ordinary platinum triangle.

In order that the use of this alloy might be experimented with for this purpose, several triangles were made. This was accomplished, in each case, by twisting together the ends of three pieces of No. 13 nichrome wire, each about four inches long. The triangles made in this manner were used to support platinum crucibles, which were ignited side by side with others supported either on platinum or common pipe-stem triangles. The crucibles showed about the same loss in weight when ignited by similar means on any of the triangles mentioned. This was true whether they were ignited over a Bunsen burner, blast lamp, using city gas (containing a large amount of sulfur) or a gasoline blast lamp. The nichrome triangles, themselves, when used with city gas, either over the Bunsen or the blast, lost, at most, one milligram an hour and at times showed either a slight gain or no loss at all. When the gasoline blast was used (this gas did not contain any sulfur) the loss of either the crucibles or the triangles was not more than two- or three-tenths of a milligram an hour. One of these triangles will outlast a number of pipe-stem triangles and at the same time allow a higher temperature to be obtained in the crucibles. In fact they make a good substitute for platinum triangles and can be made for the price of a pipe-stem triangle. This article has been put on the market by H. C. Stoelting & Co., Chicago. R. C. BENNER.

UNIVERSITY OF ARIZONA,
TUCSON.

ON THE ACTION OF CHROMYL CHLORIDE ON INDIA RUBBER.

[PRELIMINARY COMMUNICATION.]

BY D. SPENCE AND J. C. GALLETLY.

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The singular reactivity of india rubber towards sulfur chloride is well known, for on the results of this activity depends the technical process of "cold vulcanization." As far as we know however the action of chromyl chloride on rubber has never been investigated, a fact the more surprising in view of the work of Etard,[1] of Bredt and Jagelki[2] and of Henderson[3] and his scholars on the action of chromyl chloride on the terpenes, and of the close relationship which was at one time supposed to exist between india rubber and the terpene hydrocarbons.

In these, our preliminary researches, we have endeavored to investigate the action of chromyl chloride on rubbers of different botanical origin. We have actually found that in every case this substance reacts with india rubber to form a perfectly definit compound of the formula $C_{10}H_{16}.2(CrO_2Cl_2)$ analogous to the compound formed by the action of

[1] *Ann. chim. phy.*, 22, 218 (1881). *Compt. rendus*, 116, 434 (1893).

[2] *Ann.*, 310, 112 (1899).

[3] Henderson, *J. Chem. Soc.*, 55, 45 (1889). Henderson, Gray, Smith, *Ibid.*, 83, 1299 (1903). Henderson, *Ibid.*, 91, 1871 (1907). Henderson and Heilborn, *Ibid.*, 93, 288 (1908).