minations of specific temperature reaction published by Thomson and Ballantyne,[1] who have done most toward putting the test upon a satisfactory basis, and those obtained by us as described above and shown in detail in Table III.

TABLE IV.—COMPARISON OF AVERAGE RESULTS—SPECIFIC TEMPERATURE REACTION.

	Thomson and Ballantyne.		Table III above.	
Description of oil.	No. of samples examined.	Average figure.	No of samples examined.	Average figure.
Linseed (raw)	4	315	2	299
Poppyseed	..	...	1	212
Maize	..	...	2	163
Cottonseed	3	167	3	152
Rape	5	133	2	150
Peanut (arachis)	2	121	1	161
Sesame	..	...	1	143
Almond	..	...	1	95
Olive	11	92	1	90
Castor	2	91	1	84
Menhaden	1	306	2	333
Codliver	3	254	2	270
Seal	4	222	1	255
Whale	1	157	.	...
Lard oil	..	...	2	85
Sperm oil	1	100	1	102
Arctic sperm	1	93	.	...
Rosin oil	..	...	1	72

With most of the vegetable oils the results obtained by us with the diluted acid are slightly lower than those reported by Thomson and Ballantyne, while with the few animal oils compared our results are a little the higher. In general the agreement between the two sets of results is sufficiently close to indicate that the adoption of the modification here used involves no radical departure from what has heretofore been considered the best practice.

A NOTE ON THE DETERMINATION OF MOLYBDENUM IN STEEL.[2]

BY GEORGE AUCHY.

Received January 23, 1902.

UP to recently the analyst has not often been called upon to determine molybdenum in steel, but in the future this determination will be frequently made. To steel works chemists

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[1] *Loc. cit.*

[2] Read at the meeting of the Philadelphia Section of the American Chemical Society, January 16, 1902.

accustomed to determining phosphorus indirectly from the volumetric estimation of the molybdic acid in the yellow precipitate by zinc and permanganate, this would seem to be the easiest and simplest way also of determining molybdenum in steel; first, of course, separating the molybdenum from the iron by ammonia or soda. The point to be settled is: Can the molybdenum be completely separated from the iron by one precipitation with ammonia or caustic soda?

It will be found upon trial that the use of ammonia in only moderate excess, at least, is entirely out of the question. But the following results indicate that caustic soda answers sufficiently well for practical purposes, though not perfectly. Perfect separations by this reagent were, however, obtained by Ibbottsen and Brearly.[1] In these tests the molybdenum was determined gravimetrically in an aliquot part of the filtrate.

	Per cent.	Per cent.	Per cent.	Per cent.
Molybdenum present	5.23	5.23	5.23	5.23
Molybdenum found	5.26	5.14	5.18	5.22

In the following, the molybdenum in the filtrate was determined volumetrically—zinc and permanganate.

No.	Molybdenum present. Per cent.	Molybdenum found. Per cent.
1	5.23	5.14
2	5.23	5.14
3	1.05	1.07
4	2.10	2.11

The writer proceeds as follows: Not more than 1.308 grams of steel are treated with a large excess of strong nitric acid and a little potassium chlorate (if chromium is also present, as is usually the case); the nitric acid is evaporated off, boiled with strong hydrochloric acid, and evaporated to dryness to separate silica; again taken up with strong hydrochloric acid and evaporated to first appearance of scum. Then 5 cc. strong hydrochloric acid, diluted to 20 cc. with water, are added and heated to effect complete solution. The volume of the liquid is made up to 50 cc. and poured, little by little, with shaking, into 20 grams caustic soda dissolved in 100 cc. water in a 12-ounce Erlenmeyer flask, provided with a file mark at 300 cc. The liquid is diluted to this mark and mixed by shaking around in the flask, allowed to settle, and filtered into a 250 cc. measuring flask, until it reaches the mark. Then trans-

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[1] *Chem. News*, 82, 2137.

ferred to a beaker, acidified with sulphuric acid, boiled down to less than 100 cc., and finished as in phosphorus determinations, by reducing with zinc, and titrating with permanganate.

The blank or dummy test is a highly important one. It must be done on a molybdenum-free steel in exactly the same way as the test: the same amount of hydrochloric acid and the same amount of chromium. Both the hydrochloric acid and the chromium affect the dummy, the former very greatly, and the latter slightly.

	Permanganate. cc.
Dummy test, without hydrochloric acid	0.6
Dummy test, with hydrochloric acid	1.2

Below are results obtained by use of the latter dummy result (chromium not added) in steels containing same amount of chromium as molybdenum.

No.	Molybdenum present. Per cent.	Molybdenum found. Per cent.
1	1.05	1.12
2	2.61	2.65
3	5.23	5.35

Although the most of the chromium is precipitated with the iron, it would seem from these results that enough passes into solution to slightly affect the end-point of titration. Hence the necessity for its presence in the dummy test.

In the gravimetric method the first lead molybdate precipitate is always contaminated with a little chromate.

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PRELIMINARY NOTE ON A NEW SEPARATION OF THORIUM.

BY FLOYD J. METZGER.

Received January 6, 1902.

IN an investigation still in progress, attention has been particularly directed to the use of the weaker organic acids for the separation of thorium from cerium, lanthanum, and didymium, and it is in this field that it is desired to announce some preliminary results.

It is found that from a 40 per cent. alcoholic solution, thorium is precipitated quantitatively on the addition of fumaric acid, while no change is produced by that reagent in cold solutions of cerium, lanthanum, or didymium.