

ON THE ESTIMATION OF ALUM IN BREAD.

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For a long time past the old "Normandy" or "Soda" process for the estimation of alum in bread, has been condemned on account of the great difficulty experienced in redissolving the aluminic hydrate or phosphate, after its precipitation together with tri-calcic phosphate, &c. This has led to the production of several processes, most of which are very complicated. By a slight modification in the usual method of procedure, the "Normandy" method can be rendered as accurate in its results as any of those which have replaced it. This consists in adding the boiling acid solution of the charred bread to a boiling solution of sodic hydrate, containing a large excess. I proceed as follows:—1,000 grains of bread are burnt down to a small bulk, powdered together with about 100 grain measures of hydric chloride, and warmed for a few minutes; about two ounces of water is then added, boiled for five minutes, and filtered, &c. A solution containing about 250 grains of pure sodic hydrate is made in a very little water, and to this solution, when boiling, is very cautiously added the boiling acid solution of the charred bread, the whole boiled for a few minutes, filtered and washed. The filtrate, after the addition of a few drops of a concentrated solution of disodic phosphate, is slightly acidified with hydric chloride, and subsequently rendered just alkaline with ammonic hydrate and boiled. The precipitate is collected, washed, and weighed as aluminic phosphate.

To test the accuracy of this method, I had four loaves of bread made in my kitchen, one with no alum, the others with varying quantities. Care was taken to leave as little as possible of the dough adhering to the sides of the vessel in which it was made, so that each loaf contained, practically, all the alum that was dissolved in the water with which it was made. The loaves were weighed when one day old, and 1000 grains taken of each.

	Weight of Loaf.	Grains of Alum put in.	Weight of Al. PO ₄ from 1000 grains.	= grains of Alum in loaf.
1	2 lbs.	0	·07 grains	3·50
2	1½ "	10	·32 "	12·39
3	2 "	20	·46 "	23·80
4	2¼ "	40	·76 "	44·20

It will be seen the method leaves nothing to be desired in point of accuracy, and will favorably compare with any other in respect to simplicity.*

*Since devising the above process, I have been informed by Mr. Heisch, that he, and he thinks others, have for many years applied the same principle (viz., the addition of the acid solution to an excess of boiling alkali), to the separation of aluminic hydrate from other gelatinous precipitates, having found it impossible completely to re-dissolve the aluminic hydrate by any amount of sodic hydrate if it were once precipitated.