

## AN IMPROVEMENT IN THE DETERMINATION OF FREE FATTY ACIDS

By H. B. BATTLE

I am sure that oil chemists will be interested in an improvement in the determination of free fatty acid in oils. It may be already practised by some, but if so they who use it have kept it closely to themselves.

In the determination as per Rule 272 Section 4 of the Interstate Cotton Seed Crushers Association, some use saturated salt solution while others prefer denatured alcohol. We have always preferred salt solution, and use a four ounce oil bottle for mixing. However, with high percentages, and we have repeatedly had oils of 10 to 20 percent the past season, it is very difficult to secure good results, and in any event it would require a long time with excessive agitation.

A member of our laboratory staff, J. F. Duggar, Jr., has worked out a very simple modification of this determination, and the result is very satisfactory, and reduces the time for the analysis probably fifty percent if not more. It is also easier, and so simple that it is surprising it was not suggested before. Mr. Duggar has found that it is much more satisfactory to add the quarter Normal NaOH directly upon the oil in the bottle before adding the salt solution of alcohol. Neutralization proceeds quickly, and when the end-point is nearly reached, the salt solution is added and very little agitation thereafter is necessary. The end-point is then reached readily and accurately by the addition of a few tenths.

The details of the operation, as we conduct them, are as follows: After transferring 7.05 grams oil to the four ounce bottle, the 1 percent phenolein solution is added, the bottle being filled about two-thirds the way up. The NaOH is then run in, and by a very quick pendulum motion of a few inches, the oil easily mixes with the alkali. The mixture should not be allowed to extend above the middle of the bottle. The oil seen becomes fluid, and where high percentages are present, changes first to white, quickly becoming streaked with red as the end-point is reached. We prefer an incipient red all through the liquid, before adding the salt solution to about the middle of the bottle. This is now agitated strongly by covering it with the thumb, and by violent vertical movement the red color is lost. A few drops of alkali cautiously added and repeating the shaking after each addition, will soon reach the end-point and show a faint permanent pink color. The mixture is at all times fluid, and separation promptly takes place so that the color of the salt solution can readily be observed.

In our experience we find that this simple modification has brought great relief, not only in the time saved, but in the prevention of much mental as well as physical anguish.

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