

# Rapid Iodine Value Determination Using Mercuric Acetate as Accelerator

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## ABSTRACT AND SUMMARY

Iodine values of 121 samples of butter as well as some common oils and fats were determined by both the standard and rapid Wijs and Hanus methods. In the rapid method a 2.5% solution of mercuric acetate in acetic acid was used as accelerator. Results of 1 min Wijs and 3 min Hanus methods as compared with 30 min reaction time of standard procedures show close and comparable results.

## INTRODUCTION

The iodine value determinations by the Wijs and Hanus methods are standard procedures adopted by many countries (1-4). There have been efforts to shorten the reaction time by using catalysts (5). For this purpose various catalysts have been tried but mercuric acetate was found to be the most satisfactory (4,6).

The purpose of the present study is to further reduce the reaction time given in the Green and Hoffman method (4) without causing any adverse effect on the accuracy of results.

## MATERIALS AND METHODS

121 samples of butter, olive, cottonseed, peanut, almond, sesame, and castor oil, as well as shortenings and camel depot fat, were analyzed. The iodine value determinations used were Wijs and Hanus, methods according to AOCS (3) and AOAC (7).

In the rapid procedure, a 10 ml volume of 2.5% mercuric acetate in acetic acid as catalyst was added immediately after the addition of reagent, the procedure being carried out as usual except that the potassium iodide and subsequent titration is carried out exactly 1 and 3 min after the addition of Wijs and Hanus reagents respectively.

## RESULTS AND DISCUSSION

There have been studies to shorten the reaction time in

iodine value determination (Hoffman and Green method) (6). The 3 min Wijs and 5 min Hanus methods have been found satisfactory (4,5). The use of catalyst prior to or after the addition of reagent gave variable results (5). But it has been recommended that the accelerator be added after the addition of Wijs or Hanus reagents.

No general adverse effects were influenced by the rapid Wijs or Hanus methods and the result show close agreement between rapid and standard procedures (Table I).

It is found that under identical conditions the iodine value determination by the Hanus method gave values slightly lower than the Wijs method. The Wijs method gave more consistent results as compared with theoretical values (5), while the Hanus method even in rapid procedure gave slightly lower values (Table I).

On the basis of data presented it can be suggested that the 1 and 3 min accelerated iodine value determinations by the Wijs and Hanus methods respectively for common oils and fats give satisfactory results.

## ACKNOWLEDGMENT

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TABLE I

Comparison of Mean Iodine Values of Oils and Fats by Standard and Rapid Procedures

Sample	Number of samples tested	Wijs		Hanus	
		30 min	1 min	30 min	3 min
Butter	49	34.5	34.7	34.7	34.6
Camels depot fat (various parts)	6	35.1	35.3	34.6	34.3
Olive oil	14	88.0	88.8	88.5	88.3
Peanut oil	12	90.2	90.8	89.0	89.5
Maize oil	7	127.5	127.0	124.1	124.4
Cottonseed oil	6	115.1	114.6	112.5	110.7
Sesame oil	6	112.0	113.5	109.9	111.0
Almond oil	6	89.5	93.1	89.7	90.8
Castor bean oil	3	86.5	85.0	84.8	84.0
Vegetable shortenings	6	78.3	78.4	77.9	77.6
Coconut oil	6	12.6	12.5	12.4	12.4