Titrimetric Determination of Hydrogen Peroxide and Sodium Perborate by Periodate

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Manuscript received 13 September 1976, revised 28 February 1977, accepted 27 April 1977

HUCKABA and Keyes[1] determined hydrogen peroxide with permanganate in acid medium. Willard and Young[2] obtained good results with ceric sulphate. Perborate reacts with potassium permanganate and ceric sulphate in the same way as hydrogen peroxide. Schwicker[3] reduced periodate to iodate in alkaline medium with hydrogen peroxide. It has been observed in the present investigation that if periodate is taken in excess, hydrogen peroxide and sodium perborate are quantitatively oxidised.

$$IO_4^- + H_2O_2 \rightarrow IO_3^- + H_2O + O_2 \quad \ldots \quad (1)$$
$$IO_4^- + BO_3^- \rightarrow IO_3^- + BO_2^- + O_2 \quad \ldots \quad (2)$$

Periodate can be selectively masked with molybdate whereas iodate remains unaffected[4]. The same masking effect has been utilised in the determination of iodate formed by periodate oxidation of hydrogen peroxide and sodium perborate (eq. 1 and 2). The reaction products in each case are treated with potassium iodide in presence of chloroacetic acid buffer after masking periodate with molybdate :

$$IO_3^- + 5I^- + 6H^+ \rightarrow 3I_2 + 3H_2O \quad \ldots \quad (3)$$

Since the iodate formed is stoichiometrically related to the amount of the substance taken, the liberated iodine can be represented by

$$H_2O_2 \approx NaBO_3 \approx 3I_2$$

The titration of the liberated iodine makes the method highly sensitive and suitable for the determination of small amounts of the substances.

Experimental

All the chemicals used were of analytical grade commercially available. Solutions of hydrogen peroxide and sodium perborate were prepared by dissolving these substances in distilled water and standardised iodometrically.

Buffer solution was prepared by dissolving 25 g of chloroacetic acid in 70 ml distilled water and its *p*H adjusted to 2.9 with a strong solution of sodium hydroxide.

2 *M* molybdate solution was prepared by dissolving ammonium molybdate in hot distilled water.

Procedure :

A suitable aliquot of the substance to be determined was pipetted into an Erlenmeyer flask containing an excess of potassium metaperiodate (50-100 mg). The contents of the flask were shaken for 2-3 min and 10 ml of 2 *M* ammonium molybdate followed by 10 ml of chloroacetic acid buffer were added. 1 g of potassium iodide was then added and contents of the flask thoroughly mixed. The liberated iodine was titrated with 0.1 *N* sodium thiosulphate solution. The results are given in the Table. 1

TABLE 1 DETERMINATION OF HYDROGEN PEROXIDE AND SODIUM PERBORATE

Taken	*Found*	*Error*
	Hydrogen Peroxide (mg)	
4.72	4.70	−0.02
5.50	5.50	0.00
6.57	6.55	−0.02
7.08	7.08	0.00
7.99	8.02	+0.03
8.96	9.01	+0.05
	Sodium Perborate (mg)	
20.66	20.66	0.00
24.10	24.23	+0.13
27.54	27.54	0.00
31.52	31.37	−0.15
35.46	35.45	−0.01
39.40	39.53	+0.13

Acknowledgement

The authors express their thanks to the authorities of Regional Engineering College, Kurukshetra for providing research facilities.

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Study of Cucumis melo utilissimus Seed Oil

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Manuscript received 30 March 1976, revised 11 October 1976, accepted 22 April 1977

CUCUMIS MELO UTILISSIMUS Duthie and Fuller known as *Kakri* in hindi belongs to the family cucurbitaceae. Seeds are cooling, nutritious, diuretic and used in painful micturition and suppression of urine[1]. It is cultivated in many parts of India, specially in upper India and particularly in Uttar Pradesh and Punjab[2]. The present work deals with the chemical investigation of the seed oil of *Kakri* which has not been reported so far. Taking into account the medicinal use of the seed of the plant information on general characteristics and fatty acid

*For correspandence