

savings are estimated to be \$3000 a year. A further advantage is in the elimination of the concomitant health hazard.

Conceivably, this aerosol control of pests might have application for the protection of other kinds of museum collections, especially those of a biological nature.

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## Oxidation of Ascorbic Acid to Dehydroascorbic Acid at Low Temperatures

IN OUR work with ascorbic acid we have had occasion to store some of our plant material in a deep freezer at a temperature of  $-20^{\circ}\text{C}$  for several days and, on analyzing the material, we have found that all, or practically all, the ascorbic acid had been oxidized to dehydroascorbic acid. As we have not found this information in the literature, and feel that it may be of some importance to other investigators, it seems appropriate to publish this short note.

Table 1 shows several experiments with different

TABLE 1  
INFLUENCE OF TREATMENT AND STORAGE OF PLANT MATERIAL ON OXIDATION OF ASCORBIC ACID TO DEHYDROASCORBIC ACID (IN MG/100G OF FRESH PLANT MATERIAL)

Plant material	Treatment	No. days storage at $-20^{\circ}\text{C}$	Total ascorbic acid	Dehydroascorbic acid
Cocklebur				
Leaves from flowering plants	Frozen	3	53.0	53.0
	Fresh			
Leaves from vegetative plants	Frozen	3	52.8	51.0
	Fresh			
Soybean leaves	Fresh	0	117.0	6.7
	Frozen	1	100.0	80.0
	"	2	100.0	83.5
Tomato leaves	Fresh	0	31.5	7.5
	Frozen fresh	1	29.0	22.5
	" "	3	27.0	24.0
	" "	19	24.7	24.7
	" "	54	30.3	30.0
	Lyophilized	1	23.5	9.0
	"	3	23.0	9.5
	"	19	25.7	10.3
	"	54	31.3	12.7

plants, all demonstrating the same thing; namely, that at a temperature of  $-20^{\circ}\text{C}$  oxidation is quite rapid, and, if one is interested in keeping the vitamin C in the reduced form, some other means of storing should be found. In enzyme studies it is a common practice to lyophilize the material to be used if it cannot be studied at once. Accordingly, some tomato leaves were lyophilized, and others were packaged and put in the deep freezer at once. The lyophilization reduced the

weight to about 10% of the fresh weight, which is about the same as that obtained by drying the plants at  $95^{\circ}$  overnight. The dried material was packed in weighing bottles and stored at the same low temperature as the fresh material, and determinations were made at intervals. Over a period of 54 days of storage, only 16.7% more ascorbic acid had been oxidized than was present in this form in the original fresh material, whereas in the same material stored fresh at  $-20^{\circ}$  for even as short a time as 24 hr there had been an increase in the oxidized form of 53.8%. After 54 days all the ascorbic acid was present as dehydroascorbic acid. The variation in total ascorbic acid at different periods of analyses is probably due to sampling rather than to any deterioration, as is shown in the last determination 54 days after harvesting.

It is rather surprising that there should be this rapid oxidation at such a low temperature. Mills, Damron, and Roe (1) report that in orange juice stored at  $2^{\circ}\text{C}$  there was a slow oxidation, and that after 38 days of storage there was still about 30% of the total vitamin C present in the reduced form.

### Reference

1. MILLS, M. B., DAMRON, C. M., and ROE, J. H. *Anal. Chem.*, **21**, 707 (1949).

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## Passport Procedures

AT HIS news conference on June 18 Secretary of State Dean Acheson made the following extemporaneous remarks concerning passport procedures:

I should like to talk with you for a few moments about the passport work of the Department. I am doing this because it has been the subject of discussion throughout the country pretty much over the years but rather intensively in the last few weeks.

The criticisms of the Department fall into two main categories.

One of them comes from very determined efforts which have been made by Communist organizations who attack the Department and undermine its work in order to obtain greater freedom of movement for people engaged in the Communist movement and in Communist-front organizations. There was recently a meeting in Chicago which was devoted to this purpose. It was a meeting of an organization called the "American Committee to Survey Labor Conditions in Europe." This was an organization which had sent propaganda groups to Moscow, and the purpose of the meeting was to start a vigorous campaign against the State Department because of its passport policy with respect to Communists. With that criticism I am not concerned. We expect that, and that, of course, is a matter to which we will pay no attention.

There are other discussions by people who are not in any way affiliated with such groups who are sincerely worried about procedures, although they do not, I think, attack the principles upon which we operate. They are concerned about our procedures, and it is about those procedures, against the background of the passport, the development of the passport over the past 30 years or so, that I wish to speak.