females was not indicated by a significant difference in hemoglobin concentration of the blood at the beginning of the test period. Elvehjem[3] has stressed the necessity of exhaustion of body iron stores in preparation of test animals, and the question arises as to what evidence of exhaustion can be accepted. Allowing the hemoglobin level to fall too low results in animals which are sickly and not capable of a normal response to the iron supplement given subsequently.

Whatever is the explanation of this greater hemoglobin regeneration in anemic female rats as compared with males, it is the authors' belief that ignorance of this fact may explain some of the discrepancies of the same magnitude in the findings in various laboratories relative to the availability of iron in foodstuffs.

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A CATALYTIC METHOD FOR THE PREPARATION OF α-PYROABIETIC ACID

THE preparation of the so-called pyroabietic acids by the usual prolonged high temperature treatment of rosin[1, 2] entails very considerable pyrolytic decomposition, with consequent contamination of the resulting product. In connection with recent experiments on dehydrogenation of rosin products (rich in pimaric acids), by way of palladium charcoal,[3] it was noted that an appreciable proportion of a positive rotating acid survived the high temperature (300–325° C.), a region normally well above that at which decarboxylation of rosin acids takes place. The isolated acid did not give a crystalline sodium salt characteristic of α-pimaric acid, nor did it have its optical properties.[4] Its melting point (171–172° C.), rotation ($[\alpha]_d^{20} + 54°$; $[\alpha]_j^{20} + 58°$) and other properties agree well with those of α-pyroabietic acid described by Dupont-Dubourg, Fanica and others. Subsequent experiments with the palladium charcoal catalyst showed that the isomerization can be carried out at much lower temperatures (250° C.) and completed in about two or three hours. The yield at the lower temperature is excellent, the product quite uniform and apparently unaccompanied by the usual intermediate isomers. Acids with the same properties were obtained with this catalytic procedure from α-pimaric acid, l-abietic acid (Schulz), mixed rosin acids and rosins from longleaf and slash pines (*Pinus palustris* and *Pinus caribaea*) and French gum (*Pinus pinaster*). This finding, which would indicate highly selective isomerizing action for the catalyst, is in marked contrast with results obtained by the usual 100-hour heating without a catalyst when applied to rosin acids and rosins from different sources.[2]

Preliminary experiments showed that palladium charcoal catalyzes the isomerization even at 200° C., but not as effectively as at higher temperatures. Platinum charcoal, nickel charcoal and, to a lesser extent, activated charcoal itself also catalyzed the formation of pyroabietic acid.

This laboratory is at present engaged in a systematic study of the application of various catalysts and different types of carriers to the primary rosin acids, as well as the rosin acids or partially isomerized acids. Publication of more comprehensive data is contemplated in the near future.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

PRESERVING THE NATURAL COLOR OF GREEN PLANTS[1]

IMPROVED teaching methods of botanical subjects demand better demonstration materials. Living specimens should be preferred to non-living ones. However, increased difficulties in obtaining living specimens forces the use of more preserved forms. Better methods of preservation are needed to increase attractiveness of dead specimens. Several methods have been published which are more or less useful. Keefe's[2] method is outstanding among these. The writer has experimented with older formulae as well as new combinations for a period of about three years. Out of this work success with one new, general method seems to justify publication.

Formalin-acetic acid-alcohol solutions (5 cc of commercial formalin, 5 cc of glacial acetic acid and 90 cc of 50 per cent. ethyl alcohol; or 10 cc of commercial formalin, 5 cc of glacial acetic acid and 85 cc of 70 per cent. ethyl alcohol) are in general excellent preservatives. They are being used extensively for museum and histological materials. By adding 0.2 gram of copper sulfate to 100 cc of either of these F.A.A. formulae, a preservative results which will bring about an almost normal green color in nearly all

[1] Dupont and Dubourg, *Bull. Inst. Pin.*, 51: 181, 1928.
[2] Fanica, *Bull. Inst. Pin.*, 44: 155, 1933.
[3] Method of Ruzicka and Waldman, *Helv. Chim. Act.*, 16: 842, 1933.
[4] S. Palkin and T. H. Harris, *Jour. Am. Chem. Soc.*, 55: 3683, 1933.

[1] Papers from the Department of Botany, the Ohio State University, No. 383.

[2] Keefe, Anselm Maynard. SCIENCE, 64: 331–332, 1926.