

cal holder is desirable. All that is required is an adjustable clamp mounted on a base. Several such clamps have been improvised from apparatus found in the laboratory. A serviceable clamp was made from the small brass, standard-threaded parts purchasable at any electric-fixture counter. This assembly included a base, one or more ball-and-socket connections and a short piece of threaded tubing with a nut. A hole drilled through the tubing received the pin-vise, which was then clamped by screwing down the nut.

Adjustments for grinding are made under the binocular. The oilstone must rest on a firm base. The needle point is placed on the stone and, under the pressure necessary for proper grinding, is adjusted to the desired angle. Grinding is accomplished by moving either the stone or the whole needle-clamp assembly. The latter may be picked up and turned as a whole for inspection of the needle as often as desired without disturbing the grinding adjustment.

Needle-blades of any size, ground to a variety of shapes, may be fitted to the micro-scissors, enlarging their usefulness for many different types of work. The models described were made in the machine shop of the Harvard Medical School.

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THE PREPARATION OF DOPA-MELANIN

THE work of Bloch,¹ Raper² and their co-workers has shown that natural melanin is most probably formed by the oxidation of tyrosine. The first oxidation product is dopa (1-3,4-dihydroxyphenylalanine); dopa is oxidized to a red compound which, in the presence of oxygen, spontaneously changes to melanin (dopa-melanin).

Bloch and Schaaf³ observed that dopa spontaneously oxidizes in alkaline solution to form dopa-melanin.

50 cc of a 0.01 *N* NaOH solution is saturated with dopa, and the resulting solution is placed in a 75 cc test tube. Air, saturated with water (to prevent excessive evaporation), is bubbled through this solution. The solution, which turns pink when the dopa and NaOH are mixed, quickly turns jet black. After 2 days, the melanin solution is made acid by the addition of 2 cc of 0.5 *N* HCl. The insoluble melanin is centrifuged down and the precipitate is washed 10 times with 10 cc portions of 0.005 *N* HCl. The melanin is now suspended in distilled water and transferred to an evaporating dish. The HCl is removed by evaporation to dryness on a water bath, after which the melanin is further dried over P₂O₅.

¹ Bloch, *Z. physiol. Chem.*, 98: 226, 1917.

² Raper, *Physiol. Rev.*, 8: 245, 1928.

³ Bloch and Schaaf, *Biochem. Z.*, 162: 181, 1925.

Thirty-five to forty per cent. of the weight of the original dopa can be recovered as melanin by this method. Florence, Ensolme and Pozzi⁴ have stated that the formation of melanin from tyrosine, using tyrosinase, is a limited reaction; the weight of melanin obtained in their experiments was about 40 per cent. of the initial weight of the tyrosine.

If stronger NaOH solution is used in making dopa-melanin, some of the pigment apparently is converted to a red-brown substance which is soluble in HCl.

It seems likely that natural melanin contains polypeptide side chains which are not present in synthetic melanin. Abderhalden and Guggenheim⁵ have demonstrated that polypeptides which contain tyrosine will form melanin when they are oxidized in the presence of tyrosinase. Gortner⁶ succeeded in isolating a melano-protein from the wool of black sheep.

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⁴ Florence, Ensolme, and Pozzi, *Bull. soc. chim. biol.*, 17: 290, 1935.

⁵ Abderhalden and Guggenheim, *Z. physiol. Chem.*, 54: 331, 1908.

⁶ Gortner, *Proc. Soc. Exp. Biol. Med.*, 9: 120, 1911.

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