

SHORT COMMUNICATIONS

A technique for the preparation of thin sections for thermal treatment, together with their remounting.

DETECTION and analysis of small changes in the optics of crystals after heat treatment can only be obtained with precision by making two sets of determinations, one before and one after heating, upon the same crystals in a thin section. For temperatures above 500° C. ordinary sections made on glass slides are useless. The following method has been devised to allow a thin section to be heated to 1100° C.

The thin section is prepared in the usual manner upon a slide, not of ordinary glass but of transparent, isotropic silica-glass. When covering the thin section with the glass coverslip, the balsam should be slightly 'overcooked' to facilitate subsequent removal.

After measurement of the chosen crystals, the section is prepared for heating. First, the coverslip is removed mechanically with a razor-blade. The section is then placed face upwards across two low supports in a crystallization dish, and sufficient chloroform is added to immerse it. After one hour the balsam cementing the section to the slide should be completely dissolved. The chloroform is then removed with a dropper, great care being taken in order to avoid surface ripples which will fracture the uncemented section.

The slide, with the section now resting freely upon it, is supported on a flat plate of sintered alumina and placed in an oven to be heated under the conditions desired.

When cool, the section is remounted. The slide is given a very low tilt by inserting a thin card under one end. A few drops of a solution of equal quantities, by volume, of Canada balsam and chloroform are made to coalesce at one end of the slide, and allowed to flow down the slide, engulfing the thin section. The slide is now levelled, covered with a watch-glass, and allowed to stand for 48 hours. Evaporation of the chloroform should then have rendered the Canada balsam reasonably hard. The section can be covered in the normal manner with a glass coverslip.

This method can be adapted to deal with sections already prepared on ordinary glass slides. The coverslip should be removed as before. A silica-glass slide is placed on the bottom of a crystallization dish between two glass supports. The thin section is then placed face down-

wards across the two supports so that the thin section is immediately above the surface of the silica-glass, and about 1 mm. from it. The two slides should have their longer axes perpendicular. The arrangement is shown in fig. 1.

Sufficient chloroform is poured into the dish to immerse the upper (glass) slide completely. After about half an hour, solution of the

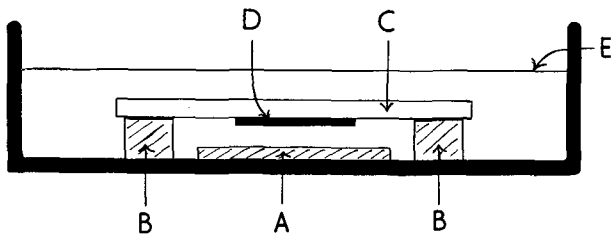


FIG. 1. Diagram, vertical scale exaggerated, showing transfer arrangement. A the Vitreosil slide, B glass supports, C the glass slide, D thin section, E surface of chloroform.

Canada balsam will allow the thin section to become detached from the glass slide, and to fall vertically onto the silica-glass slide. The glass slide is then gently manoeuvred to the side and the chloroform removed with a dropper, the rest of the process being the same as that already described.

This method of transference causes the section to be inverted, but providing photomicrographs, upon which the measured crystals can be plotted and replotted, are taken before and after heating, no difficulty should occur in tracing individual crystals.

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A section-holding chuck for use on high-speed surface-grinding machines.

THIS note describes an improved section-holding chuck for use on the table of a high-speed surface-grinding machine fitted with a diamond-impregnated grinding wheel. It also suggests modifications in mounting technique, and some measurement limits for this type of grinding.