COMPOSITE MOUNTING AND SLAB-SUPPORTING TECHNIQUES FOR POLISHED THIN SECTIONS

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To facilitate polishing and analysing time for electron microprobe composite mounting of two or more specimens in one thin section is proposed. Use of supporting slab of compact basalt to keep intact swelling and schistose rocks and very thin slabs during sawing and grinding operations is also proposed.

INTRODUCTION

With increasing use of the electron microprobe greater numbers of polished thin sections are becoming necessary. The polishing and analysis time can be greatly reduced, and precious, swelling or schistose material less likely to be lost or wasted by adopting the following related techniques both of which have been successfully used for a number of years in this Department.

COMPOSITE MOUNTING TECHNIQUE

Take two small pieces of rock and, preferably using a fine diamond lap, grind a smooth surface on the appropriate edge of each at right angles to the surface required for analysis. The faces are joined together with a good hard-setting epoxy cement. If more than two specimens are required to make one thin section, further pieces of rock can be prepared and added to those already joined in the described manner. A multiple specimen can then be prepared and cemented to a glass slide in the usual manner.

Up to four different rock samples can be incorporated in one polished thin section when rocks of similar hardness are selected (Fig. 1). To do this it is essential to accurately join together as many specimens as are required to form a single composite specimen.

Selected areas from a single rock can likewise be sectioned and joined to make a composite with resultant saving in polishing and microprobe time. A direct comparison of analytical data can be made when specimens carrying spots to be analysed and compared are brought into one polished thin section, thus minimising errors.

Specially valuable or small hand specimens can often be handled with increased safety if they are first made into a single composite and strengthened if necessary by the following slab-supporting technique.

SLAB-SUPPORTING TECHNIQUE

To safeguard against loss of specimen either in composite form, or when dealing with rocks of swelling or schistose nature, and also to accurately grind wafer-thin slabs, the following procedure may be used.

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Fig. 1. Two bonded pairs of specimens ready for cementing together to make a composite of four, all of which will be included in the final polished section.

First, cut and grind to size a support slab of basalt, approximately 5 mm thick, and using a good epoxy cement, bond the support slab onto a suitably oriented surface of the weaker material requiring to be sectioned or ground (Fig. 2). Lakeside 70°C cement is suitable as a bond where comparatively low bond strength will suffice, and if it is desirable to remove the support slab at a later time. In most cases an epoxy cement forming a stronger bond should be used. Sawing through the supported specimen at approximately 2 mm thickness can then be accomplished. The piece carrying the support slab is then ground and attached to a glass slide, and the support slab and excess thickness of specimen sawn off. In some cases it may be desirable to impregnate the cut surface at this stage before grinding and cementing onto the glass slide.

Rocks that are very difficult to section can be effectively dealt with when slab-supported in the above manner and this method ensures greater accuracy and ease of handling or grinding very thin slabs.

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EPMA 分析用研磨薄片作製上の工夫 2つ

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分析しようとする部分を含む類似した硬さの直角に切った岩片を2つ以上、正確にありあわせたものから研磨薄片を作ると、研磨時間や炭素蒸発を含む分析時間を短縮できる。また異なる岩片中の2つ以上の分析値を比較しようとするとき同一試料中に分析対象があることより、測定条件のちがいを小さくすることであるが、比較の信頼度を高めるのに役立つ。

また弱い岩石を細粒緻密堅硬な玄武岩で支持すると切断研磨がしやすい。