Acknowledgments

I am indebted to Mr. R. M. Wilke, Mr. F. J. Sperisen, and Mr. L. J. Simon for specimens of the Cascade Canyon lapis lazuli.

NOTES AND NEWS

A METHOD FOR PHOTOGRAPHING PETROGRAPHIC THIN SECTIONS AT LOW MAGNIFICATIONS

Welton J. Crook, *Professor of Metallurgy, Stanford University, California.*

In cases where it is desired to record the more gross characteristics displayed in petrographic thin sections, it becomes necessary to produce photographs at comparatively low magnifications, say from 5× to 10×. With the photomicrographic equipment ordinarily available, such operations often present considerable difficulties, particularly when a large field is desired.

It is suggested that the problem may be readily solved by the following methods:

The thin section is placed in a Leica enlarger (or similar apparatus used for enlarging Contax and Leica 35 mm. films) and the focussed projected image of the section adjusted to the magnification desired. Instead of printing the image on bromide paper which would result in a reversed picture, it is necessary to substitute a photographic plate or film, and in this way obtain a negative which may be used later to produce contact prints.

Experience has shown that process panchromatic emulsions are suitable for this purpose, especially where the thin section contains colored constituent minerals. Using a Leica enlarger with a 50-mm. lens, stopped to f:22 and a projection enlargement of 10×, exposure times will range from, say 20 seconds to 60 seconds, depending upon the thickness and color of the thin section, using Eastman Process Panchromatic cut film.

D-11 developer will give excellent contrast but if softer results are desired, D-72, diluted with two parts of water, may be substituted.

An alternate procedure may be adopted which, although more economical in negative materials, does not give as sharp and clear prints as the preceding method. In the alternate method a contact negative is produced by printing the slide directly onto a small strip of Process film. After processing, this strip is then placed in the enlarger and used as a negative.

From an optical point of view, it may be objected that even the first method proposed will not give the same resolution, for a given magnification, as would be obtained if the slide were photographed in the usual way with a very low power microscope objective. However, such objections are not altogether valid. Without reviewing the whole of the optical principles involved, it may be pointed out that the very low power objectives which must be used in the ordinary photomicrographic procedure are really short-focus photographic lenses which cover a relatively small field, and which do not usually possess a high degree of chromatic correction. In the case of the Leica or similar type of enlarger, the lenses made use of are the same as those used in the Leica and Contax "miniature" cameras. These lenses are of very high grade and are fully color corrected.

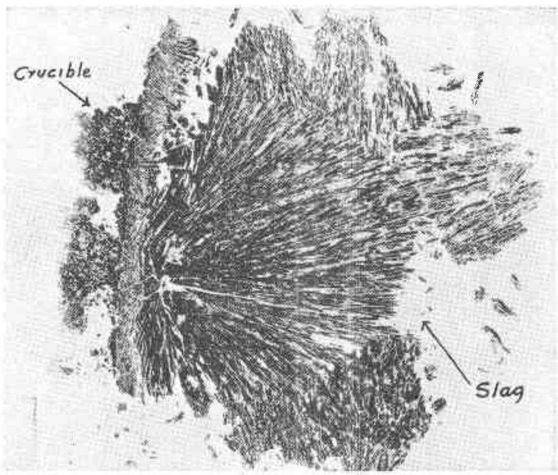

FIG. 1. Slag No. 60. 5×. Thin section of crucible and slag.

The writer is particularly interested in the mineralogy of metallurgical slags. The illustrations submitted are photographs, at low magnification, of thin sections of material of this kind.

Figure No. 1, at 5×, shows a thin section of slag No. 60. A section of the wall of the magnesite crucible, in which the melt was made, is shown as well as the radiating crystals of the slag itself. The "minerals" present are monobasic ferrite, diopside, and ackermanite.

Figure No. 2, at 5×, shows a thin section of slag No. 51. The walls of the magnesia crucible are clearly shown to be unattacked by the molten slag. The "minerals" present in this slag are diopside, monobasic ferrite, ($CaO \cdot Fe_2O_3$) ackermanite, and monticellite.

Although the photographic methods described have been applied by the writer principally to artificial mineral sections, the same procedure may be used for petrographic slides.

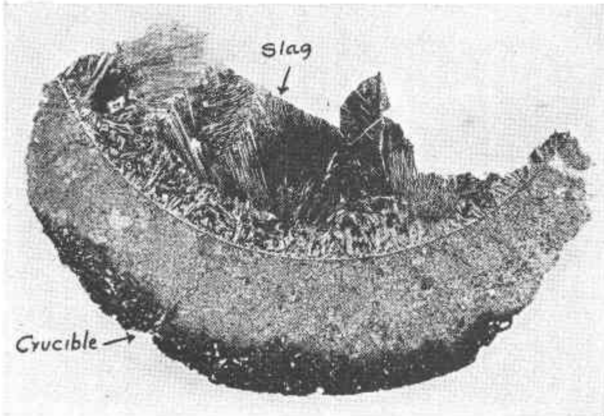

FIG. 2. Slag No. 51. 5×. Thin section of crucible and slag.

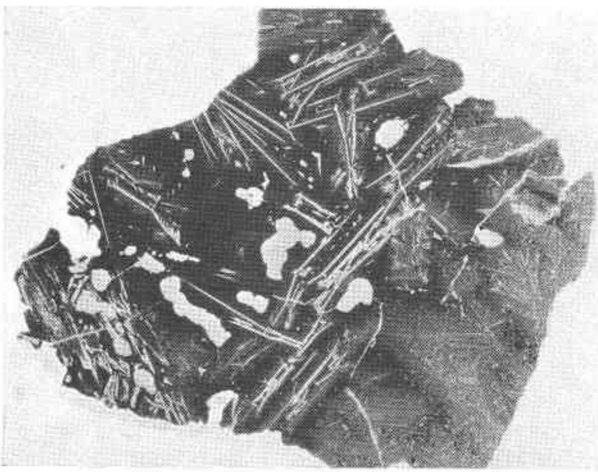

FIG. 3. Slag No. 101. 5×. Thin section. Fayalite-tridymite eutectic with excess fayalite and a small quantity of magnetite.