INTRODUCTION OF GLYCEROL INTO FLAKE AGGREGATES BY VAPOUR PRESSURE

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ABSTRACT

A vapour pressure method of glycerol treatment of clays is described and its advantages over normal methods noted.

Brunton (1955) has pointed out that addition of ethylene glycol often destroys the preferred orientation of samples of clay sedimented on slides for diffractometer study of the basal reflections. This effect is even more marked with the virtually unsupported small flake aggregate specimens used with non-focusing arrangements and is especially troublesome with friable materials. If the expanding mineral is present in small amounts the poor preferred orientation may be such that the 00*l* reflections are not observed.

Brunton proposed the use of a vapour pressure method of glycolation by suspending the slide with the clay aggregate just above a heated bath (60°C) of ethylene glycol for one hour. We have used a similar method to add glycerol to the small oriented aggregates which are normally used in cylindrical Debye-Scherrer cameras. From an aggregate prepared by centrifuging, flake specimens about $2 \times 0{\cdot}5 \times 0{\cdot}1$ mm are cut with a razor blade and mounted on fine Lindemann glass fibres with the minimum amount of adhesive. These are then placed on a perforated metal plate, the fibres supporting the specimens across the holes which are about 3-4 mm in diameter. To introduce the glycerol, a covered dish containing glycerol is first heated in an oven at 100-105°C and the metal plate with the specimens is then placed just above the glycerol surface. After two hours the specimens are removed for photographing. With this method specimens can be treated with glycerol in a reproducible way and the preferred orientation of the original aggregate is maintained.

Fig. 1, a, b and c, shows a montmorillonitic clay which has been treated by the above method for 10 minutes, 45 minutes and 120 minutes respectively, and Fig. 1, d is a soil clay treated for 120 minutes.

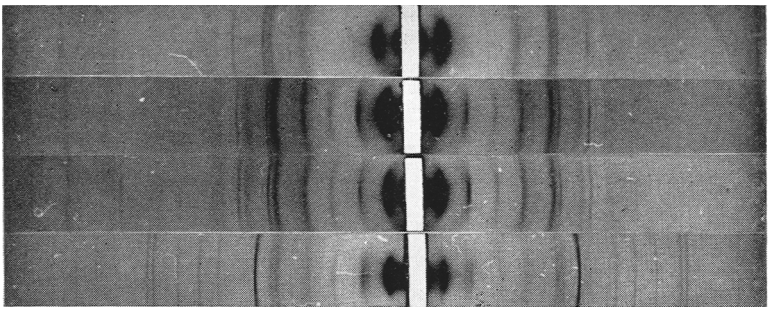

FIG. 1—X-ray patterns of flake aggregates treated with glycerol. Camera diameter 9·0 cm, radiation filtered Co Kα.

a. Montmorillonitic clay exposed to glycerol vapour for 10 minutes.
b. As above—exposed to glycerol vapour for 45 minutes.
c. As above—exposed to glycerol vapour for 120 minutes.
d. A soil clay exposed to glycerol vapour for 120 minutes.

REFERENCE

Brunton, G. 1955. *Amer. Min.*, **40**, 124-126.