

Letters to the Editor

Preparation of Glass Fragments for Analysis

Sir:

Comparisons of the basic elemental composition (sodium, magnesium, aluminum, silicon, sulfur, chlorine, potassium, iron, and sometimes barium and chromium) of glass fragments have been made for two years at the Crime Laboratory of Finland on a JEOL Model 35C scanning electron microscope equipped with a PGT-1000 XCEL X-ray analyzer. The method, in principle, is like that used in the National Laboratory of Forensic Science in Sweden [1].

The analysis requires that the geometric parameters and the instrumental settings be kept as constant as possible; therefore, the surface to be analyzed should be plane and parallel to the plane of the sample holder. However, the surfaces of small glass fragments are usually very uneven, and it is somewhat complicated to mount fragments on the holder so that the surface to be analyzed is plane and parallel. As a solution for this problem a simple method for mounting the glass fragments was developed.

The small glass fragments are washed with distilled water and acetone and placed on double-coated tape (Scotch® double-coated tape, No. 665) fixed on a plane surface. The mold, which is made of polytetrafluoroethylene (PTFE), is placed around the glass fragments (Fig. 1). If there are more than two fragments, they have to be placed at equal distances from the rim of the mold. It is then possible to analyze each fragment without altering the *x*-direction of the sample holder in the microscope chamber. The *x*-direction may not be altered without changing the geometric parameters. The polymer mixture, based on methyl methacrylate (Kulzer: Paladur, Pulver, and Flüssigkeit; made originally for dental purposes), is poured into the mold over the glass fragments. After the polymer has hardened

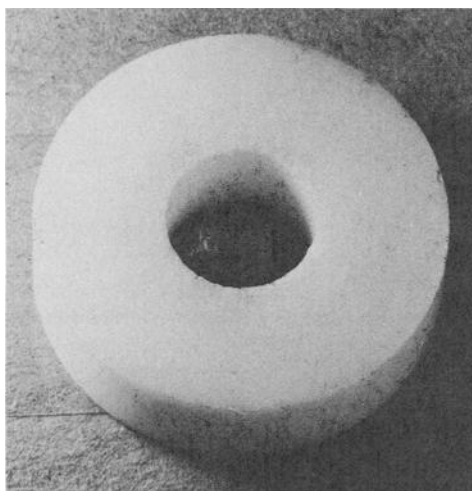


FIG. 1—*The mold around the glass fragments.*

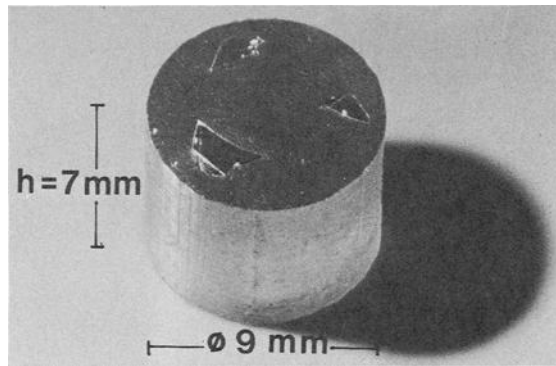


FIG. 2—The carbon-coated tablet with three glass fragments.

(about $\frac{1}{2}$ h) the formed polymer tablet is removed from the mold. The tablet is ground and polished until the surface of the glass fragments is plane.

Grinding is done by hand on abrasive paper with water. Two grades are usually enough (#400 and #600); if the glass fragments are very rough and relatively large, Grade 280 can be used for preliminary smoothing. Especially with lower grades care has to be taken not to remove the small fragments altogether.

Polishing is also done by hand with diamond paste. The back of plastic photographic "paper" was found to make a good polishing lap. A soft polishing cloth is not suitable because the small fragments become rounded on edges or wholly convex. The whole procedure of grinding and polishing takes only a few minutes.

After being ground and polished the tablet is coated with carbon (Fig. 2) and placed into the sample holder. To ascertain electrical conductivity between the thin carbon surface of the tablet and the specimen holder it is necessary to make a carbon bridge between them.

Kristine Jousimaa

Heikki Rautavuori

Crime Laboratory of the Central Criminal Police
Suvilahdenkatu 6 C, SF-00500 Helsinki 50

Finland

Reference

- [1] Andrasko, J. and Maehly, A. C., "The Discrimination Between Samples of Window Glass by Combining Physical and Chemical Techniques," *Journal of Forensic Sciences*, Vol. 23, No. 2, April 1978, pp. 250-262.

Discussion of "Evaluation of a Method Using Powder to Detect the Site of Rubber Erasures"

Dear Sir:

In this article "Evaluation of a Method Using Powder to Detect the Site of Rubber Erasures" in the October 1981 issue (pp. 724-729), Mr. D. S. Moore mentioned the paper I had sent for presentation at the 1971 Annual Meeting of the American Society of Questioned Document Examiners. I may say that I am not the inventor of that "mixture of starch and methylene blue," but that such a powder had been used in our laboratory for many years; I am unable to find any publication introducing such a powder. More recently, Messrs. S. S. Kind and M. D. G. Dabbs from the Home Office Central Research Establishment, Aldermaston, Reading, Berkshire, England, published an article entitled "The Use of Lycode Pow-

ders for the Detection of Erasures" in the *Journal of the Forensic Science Society* (Vol. 19, 1979, p. 175), in which one can read:

The adhesion of the lycode is caused by traces of eraser grease being transferred to the surface of the paper and . . . the contribution of surface damage to lycode adherence to the paper by the eraser is quite small.

In our laboratory we now routinely use both methods without being able to decide which one is better.

Professor J. Mathyer
University of Lausanne
Institute of Police Science and Criminology
Place du Chateau 3
Lausanne, Switzerland