REFERENCES

1. SCACCHI, A. (1877), *Zeits. Krist.* **1,** 398.
2. TILLEY, C. E. (1947), *Min. Mag.*, **28,** No. 197, 90.
3. MCCAUGHEY, KAUTZ AND WELLS (1948), *Am. Mineral.*, **33,** 200.
4. VAN VALKENBERG, A. AND RYNDERS, G. F. (1958), *Am. Mineral.*, **43,** 1195.
5. LAPIN, V. V. (1941), *Compt. Rend. Acad. Sci. URSS*, **31,** 694.
6. SMIRNOVA, R. F., RUMANOVA, I. M., BELOV, N. V. (1955), ZAPISKI VSESOYUZ. *Mineralog. Obshchestva*, **84,** 159.
7. UNITED STATES DEPARTMENT OF THE INTERIOR, *Geological Survey Bulletin* **848.**

THE AMERICAN MINERALOGIST, VOL. 46, MAY-JUNE, 1961

THE STABILITY OF THE ARSENIC TRIBROMIDE IMMERSION LIQUIDS DURING STORAGE*

ROBERT MEYROWITZ AND HAROLD WESTLEY, *U. S. Geological Survey, Washington 25, D. C.*

It is now 10 years since the first complete series of immersion liquids of high index of refraction (1.74–2.00) suitable for routine use was proposed (Meyrowitz and Larsen, Jr., 1951). A set of the liquids, in clear glass bottles with ground-glass stoppers and ground-glass dust covers, has been stored in a dark cupboard continuously. During this 10-year interval, the bottles were opened only a few times either to determine the index of refraction of the contained liquid or to transfer the liquid to a new glass bottle after the liquid had been filtered.

The liquids were filtered twice: first, after their indices of refraction were measured when they were 6 months old, and second, before they measured when they were 10 years old. When the liquids were 6 months old, some of the liquids had developed a slight turbidity and crystals of sulfur were present in the 1.98, 1.99, and 2.00 liquids. The liquids containing methylene iodide, sulfur, and arsenic tribromide ($n = 1.74$–1.81) were originally yellow amber and became slightly darker at the end of 6 months. Now, at the end of 10 years, they are purple brown. The liquids containing arsenic disulfide ($n = 1.82$–2.00) were originally yellow amber to dark amber and at the end of 10 years are slightly darker.

The liquids at the end of 10 years contained no large crystals. Some had a small amount of fine precipitate but the liquids were otherwise transparent and suitable for use. The inside surface of the glass bottles appeared to be cloudy as if they had been etched by the liquids or as if a fine deposit had formed on the inside surface of the bottle.

Table 1 gives the original indices of refraction of the liquids and their

* Publication authorized by the Director, U. S. Geological Survey.

TABLE 1. CHANGES IN REFRACTIVE INDICES OF ARSENIC TRIBROMIDE LIQUIDS DURING STORAGE

25° C. n_{Na} (initial)	Δn (6 months)	Δn (9 months)	Δn (10 years)
1.741	−0.001	−0.001	+0.001
1.752	−0.001	−0.001	+0.001
1.762	0.000	−0.001	+0.001
1.771	0.000	−0.001	+0.001
1.781	0.000	−0.001	+0.001
1.791	−0.001	−0.001	+0.001
1.801	0.000	−0.001	+0.001
1.810	+0.001	+0.001	+0.001
1.819	0.000	0.000	0.000
1.830	−0.001	−0.001	0.000
1.840	−0.001	−0.001	0.000
1.848	+0.002	+0.001	+0.001
1.861	−0.002	−0.002	−0.001
1.870	−0.001	−0.002	−0.002
1.880	−0.001	−0.002	−0.001
1.891	−0.002	−0.003	−0.002
1.901	−0.002	−0.002	−0.002
1.910	−0.002	−0.002	−0.002
1.920	−0.003	−0.003	−0.002
1.932	−0.002	−0.003	−0.002
1.942	−0.002	−0.003	−0.002
1.951	−0.003	−0.004	−0.003
1.960	−0.003	−0.003	−0.002
1.969	−0.003	−0.004	−0.004
1.979	−0.003	−0.003	−0.002
1.988	−0.002	−0.002	−0.001
1.998	−0.003	−0.002	0.000

change at the end of 6 months, 9 months, and 10 years. Changes in the liquids under actual use, rather than during "dead" storage, will probably be much greater.

REFERENCE

MEYROWITZ, R. AND LARSEN, E. S., JR. (1951), Immersion liquids of high refractive index: *Am. Mineral.*, **36,** 746–750.