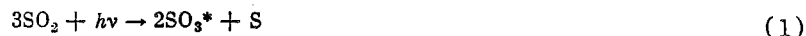


Significant photolytic separation of the sulfur isotopes was noted upon the irradiation of gaseous SO<sub>2</sub> using a PRK-4 mercury lamp ( $\lambda$  1849 Å) and the residual SO<sub>2</sub> was enriched in the light isotopes (Table 1). Analysis of the photolysis products indicated that the dissociation proceeds as follows:



and virtually only residual SO<sub>2</sub> is present in the gas phase (as determined relative to the pressure change in the reaction vessel), while the vessel surface is coated with elemental sulfur and (SO<sub>3</sub>)<sub>2</sub>-type polymer compounds. The mass spectral isotope analysis carried out according to our procedure [1] with an error of  $\pm 0.2\%$  are given in Table 1 (the initial SO<sub>2</sub> pressure in the vessel was 80 torr).

The sulfur isotope partition coefficient  $\alpha$  in this process was calculated using the generally accepted expression for enrichment upon Rayleigh exhaustion. The direction of the observed isotope effect is probably a consequence of isotope exchange between the reagent and products of reaction (1), which occurs upon the interaction of SO<sub>2</sub> with a light quantum. Comparison of the ratios of the  $\beta$ -factors of these compounds and  $\alpha_{\text{av}}$  0.9835 may indicate that the isotope effect is a function of the isotope equilibrium constant between excited SO<sub>3</sub>\* and SO<sub>2</sub>. We should also note that there is a mass-dependent sulfur isotope separation, which obeys the isotope pleiad rule  $\delta^{33}\text{S} \approx 0.505 \delta^{34}\text{S}$ .

TABLE 1

| p, mm Hg | $\delta^{33}\text{S}$ , ‰ | $\delta^{34}\text{S}$ , ‰ | $\alpha$ | $\alpha_{\text{av}}$ |
|----------|---------------------------|---------------------------|----------|----------------------|
| 20       | -11.0                     | -21.7                     | 0.9827   | 0.9835 $\pm$ 0.0008  |
| 1        | -37.7                     | -74.5                     | 0.9844   |                      |

## LITERATURE CITED

1. V. I. Ustinov and V. A. Grinenko, Precision Mass Spectrometric Methods for the Determination of the Sulfur Isotope Composition [in Russian], Izd. Nauka, Moscow (1965).