

## The Preparation of Tritelluroformaldehyde

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POLYALDEHYDES are conveniently prepared by the polymerization of cyclic aldehyde trimers using a Friedel-Crafts catalyst or  $\gamma$ -irradiation to activate the reaction. In such a manner most common aldehyde polymers, including the Group VI series, polyformaldehyde, polythioformaldehyde, and polyselenoformaldehyde, have been synthesized and characterized.<sup>1</sup> Because the structure and properties of polyselenoformaldehyde in some cases varied unexpectedly from the two other members of the series,<sup>2</sup> the investigation of polytelluroformaldehyde was initiated.

The intermediate, tritelluroformaldehyde, had not apparently been previously prepared. All attempts to prepare tritelluroformaldehyde by methods which had been successful for the synthesis of triselenoformaldehyde<sup>3</sup> were unsatisfactory.

In 1934 Rice and Glasebrook claimed to have prepared both polyselenoformaldehyde and polytelluroformaldehyde while investigating methylene reactions.<sup>4</sup> In a similar technique methylene radicals, generated by the decomposition of diazomethane at 500°, were passed over selenium

and tellurium mirrors. A series of cold traps were employed to isolate the products, which were then examined. The tellurium compound so obtained was analysed on a Varian M-66 mass spectrometer. Parent peaks from 414 to 432 a.m.u., due to combinations of the five isotopes of tellurium present in our sample, indicated that the compound was  $(\text{CH}_2\text{Te})_3$ . The fragmentation pattern confirmed this assignment. A similar analysis of the selenium compound indicated that it also was a trimer with the formula  $(\text{CH}_2\text{Se})_3$ . A comparison with synthesized triselenoformaldehyde<sup>3</sup> provided additional proof that the material collected in the cold traps was the same compound. Infrared spectra from 2.5 to 50  $\mu$  and elemental analyses further confirmed the mass-spectral results. No evidence of polymers was found.

This, we believe, was the first proof for the existence of tritelluroformaldehyde. Insufficient tritelluroformaldehyde was available to prepare and characterize the polymer.

(Received, February 27th, 1968; Com. 239.)

<sup>1</sup> J. Furukawa and T. Saegusa, "Polymerization of Aldehydes and Oxides," Interscience, New York, 1963.

<sup>2</sup> G. Carazzolo and G. Valle, *J. Polymer Sci., Part A*, 1965, **3**, 4013.

<sup>3</sup> M. L. Russo, L. Mortillaro, L. Credali, and C. DeChecchi, *J. Polymer Sci., Part A-1*, 1966, **4**, 249.

<sup>4</sup> F. O. Rice and A. L. Glasebrook, *J. Amer. Chem. Soc.*, 1934, **56**, 2381.