

contaminants that have been set by this body in the ensuing time is an indication of the magnitude of the task and suggests the necessity for a change in policy. This committee includes several recognized, competent authorities in the field of industrial toxicology, and also represents a good cross section of government and industry. There is much to be said in favor of such a body, but there are also pitfalls to be avoided. As long as the committee remains large, although it may be cumbersome, there is safety in numbers, and the large cross section of opinion may be relied upon to prevent the group from going too far astray. The most important precaution is that standards set by estimation, as nearly all of them necessarily must be, should not be considered, or portrayed, as ultimate levels of safety but only as tentative levels, representing the present consensus subject to reconsideration upon presentation of any properly weighted evidence. Another point that must be rigorously guarded against is the overbalancing of the committee in favor of persons whose training and qualifications are in the field of oratory instead of the field of industrial hygiene and toxicology. Neither the alarmists nor the purists who want to approach zero concentration of all harmful materials are sufficiently numerous, now, to seriously threaten to upset the proper balance. The opinions of all qualified and experienced people in the field should be sought. It should be remembered that the most thorough and complete toxicological data are useless unless accompanied by competent chemical analysis of the air, and the air samples must have been properly chosen to represent exposures existing during the period in which symptoms or manifestations of harmful effects developed, or were demonstrated to be absent.

CHAPTER VII

Sampling and Analysis of Atmospheric Contaminants

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In this chapter the problems involved in sampling and analyzing air contaminants are discussed from a general viewpoint with little regard for individual contaminants. It is not within the scope of this volume to give detailed methods of analysis. A rather complete compilation of such methods¹ has been published previously. In Volume II of this book outlines of, or reference to, methods of proved worth accompany the discussions of most contaminants. The methods so presented are no sense to be interpreted as the only good methods, but rather methods that have been found suitable and reliable in practice. Volume III of this book covers methods of sampling and analysis in a more comprehensive manner.

Many analytical methods available to the industrial hygienist have been standardized and simplified until they require little thought or training. On the other hand, many seemingly simple tests require a fundamental understanding of solubility, the gas laws, partial pressures, and chemical reactions. In any industrial hygiene department many questions arise that can be answered only by a qualified chemist. The method of analysis to be used will depend upon the nature of the problem at hand rather than merely upon a "standard method." The trend is naturally toward methods that give prompt results with a degree of accuracy suited to the circumstances.

The first rule the industrial hygienist should adopt regarding analytical methods is never to rely upon a method until he has personally tried it out under controlled conditions, such as: (1) by sampling a synthetic atmosphere from a proportioning apparatus or from a gastight, impervious chamber of sufficient size to permit making and sampling mixtures without introducing significant errors; (2) by introducing a measured amount of contaminant into a device attached to the sampling arrangement in such a manner as to utilize the entire amount; or (3) by comparing with a device of proved worth by sampling from a common manifold at constant rate over the same period of time.

In evaluating concentrations of atmospheric contaminants of interest to the industrial hygienist, the following book is recommended: M. B. Jacobs, *Analytical Chemistry of Industrial Poisons, Hazards, and Solvents*. 2nd ed. Interscience, New York-London, 1949.