# A RETROSPECTIVE LOOK AT THE CARCINOGENIC POTENCY OF VINYL CHLORIDE

John T. Barr

Air Products and Chemicals, Inc.
Allentown, PA 18105

ABSTRACT

Failure to find any cases of vinyl chloride-induced cancer outside the heavily exposed reactor cleaner group calls into question the human relevance of predictive methods for carcinogenic potency. Potency estimates by six conventional routes are reviewed with special attention to the implication of each route for vinyl chloride. New metabolic and mechanistic data are used to suggest a basis for the failure of "classical" risk assessment methods to provide accurate predictions for humans in this instance.

KEY WORDS: Angiosarcoma, Carcinogenicity, Epidemiology, Latency, Potency, Risk Assessment, Vinyl Chloride

The practice of estimating the quantitative risk to humans from exposure to carcinogens has expanded widely in the last ten years. In many cases the thrust has come from the need or the desire to evaluate long lists of chemicals for regulatory decision making. There has been a concomitant increase in the effort to standardize the procedure in order to save time, and to provide means of obtaining estimates in the absence of a complete data base, as is often the case.

This situation has led to the widespread use of the deceptively simple expression. Risk = Potency times Exposure. There often are problems in estimating exposures of the past, but frequently they can be estimated with about as great precision as potency can be estimated. Current exposures can be determined accurately, and acceptable future exposures could be determined if only the potency was known. Thus, the value of potency, although equal in weight to exposure in determining the risk, usually is the primary subject of investigation.

Some regulatory agencies have practiced projection of carcinogenic risks for exposure to substances whose carcinogenicity has not been determined. This "what if" type of approach would have some utility if the finding of an impossible rate of mortality by such a calculation would result in the withdrawal of the estimate or assist in concluding that the substance is not a carcinogen. Unfortunately, that has not occurred regularly, and such potency estimates acquire a life of their own, living on in agency control requirements and in the popular press long after any scientific support for such action has vanished.