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Receptor Modeling: Assessment of the State-of-the-Art

P.K. Hopke (1)

(1) Center for Air Resources Engineering and Science, Clarkson University, Box 5708, Potsdam, NY 13699-5708 USA (hopkepk@clarkson.edu, Fax; +‘1 315 268 4410)

Receptor models are used to identify and apportion sources based on measurements of the chemical and/or physical properties of the atmosphere at the point of impact. Over the past 30 years, these methods have been developed and improved as have the quality of the input data on which the models depend. Methods are available to apportion the quantities of particulate matter or volatile organic compounds to sources depending on what is known *a priori*. If the number and nature of sources are known, then the Chemical Mass Balance can be applied. If the sources are unknown, then various forms of factor analysis are used with some of the major recent advances coming in the development of the new methods, Unmix and Positive Matrix Factorization. Illustrations of these apportionment methods will be presented. In addition meteorological information in the form of either local wind speed and direction or air parcel back trajectories can be used to identify the likely locations of local and distant sources, respectively, based on the estimated source contributions. Examples of recent applications of these methods to standard particle composition data, particle size distributions and highly time resolved particle size distribution, composition, and related pollutant gas data will be shown.