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Aerosol formation from oxidation of pesticides. An atmospheric chamber study.

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Pesticides, mainly used on agriculture, can enter the atmosphere through volatilisation during application, or by the subsequent evaporation from water and plant surfaces or soil erosion,. The concentration of these compounds in the atmosphere, as well as its potential derivatives, is a major problem for human health and the ecosystem. As other volatile and semi-volatile organic compounds, the degradation of pesticides present in the atmosphere can be accomplished by different reactions. However, there are very few studies of the behaviour and fate of pesticides in the atmosphere and especially about the aerosol products [1]. These atmospheric aerosols can contribute to the photochemical smog effect, associated with various respiratory diseases and to the decrease of air quality.

Our study was focused on the aerosol formation processes from several pesticides, by analysing their processes of photolysis or photooxidation in a large photoreactor (European photoreactor EUPHORE, 200 m^3) under closed reality conditions. The pesticides studied were selected to be the main used in the Mediterranean area and to be included in Annex I of the 91/414/CEE directive.

The experiments consisted of photolysis with sunlight, or by. reaction of pesticides with hydroxyl radicals (·OH), and reaction with ozone (O_3). Aerosol properties such

as size distribution, mass concentration, yields and density were determined. A scanning mobility particle sizer (SMPS) and tapered element oscillating microbalance (TEOM) were employed to establish the profiles of particle formation. [2].

These results will provide information about the degradation mechanisms of atmospheric pesticides and their role on atmosphere aerosol formation.

Bibliography

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