DETERMINATION OF $CHFCl_2$ (CFC21) IN THE TROPOSPHERE

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In the frame of the controversy about stratospheric ozone depletion by halocarbons, it has been hypothesized that CFC21, which has no industrial use, could be a decomposition product of CFC11.
However the quantitative analysis of this compound is quite difficult because of:

i) its low concentration

ii) difficult GC separation fom other halocarbons and possible interferences and sample contamination.

This problem has been solved by using analytical techniques based on the following points:

1) Sampling is carried out by trapping air on Carbopack B (graphitized carbon black) at low temperature and injecting via the heat stripping technique (1). This allows sampling of large air volume (up to 30 liters).
2) Analysis is performed by GC-ECD and GC-MS. An extremely selective GC column is used which allows the separation of most halocarbons possibly present in the atmosphere (1). The Mass-spectrometer, used in the multiple ion monitoring mode (M.I.D.) (2), offers a very reliable method for the qualitative and quantitative determination of halocarbons (3).
3) Calibration is carried out by means of permeation tubes that allow to obtain the most reliable primary standard because of the accuracies of gravimetric measurements (4).

Samples collected at different locations have been analyzed. Depending on meteorological conditions, latitude and seasons, concentrations of CFC21 much larger than expected have been found.

The regularities connected to the appearances and disappearances of CFC21 are such that the need for more extensive measurements are impe rative to ascertain wether the hypotesis made about its origin can be feasible or not.

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