



Influence of the meteorological parameters on CFCs and SF6 concentration in the air of Krakow, Poland

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key words: gas chromatography, trace gases, CFCs and SF6 measurements in urban area.

Halogenated compounds (chlorofluorocarbons-CFCs), both natural and industrial, so-called freons, currently exist as trace gases in the entire human environment. The CFCs cause ozone depletion in the stratosphere. Moreover CFCs and SF6 take part in intensification of the greenhouse effect. The decisions of the Vienna Convention (1985) and of the Montreal Protocol (1987) limited the world production level of CFCs in the year 1989 at least 35% after 2004, 90% after 2015 and total reduction after year 2030.

On account of international agreements, the measurements of CFCs and SF6 in air were started. Measurement “clean” stations were situated at places outside of urban areas influence and gathered on world program – AGAGE (Advanced Global Atmospheric Gases Experiment). One of these stations is Mace Head (Ireland, 53o N, 10o W), which participates in AGAGE since 1987 [1] and in European InGOS (Integrated non-CO₂ Greenhouse gas Observing System) program since 2011. Similar research is also conducted in Central Europe, in urban area of Krakow (Poland, 50o N, 19o E) since 1997.

The work discusses results from 15 years of concentration measurements (in the years 1997-2012) of selected halocarbons and SF6 in Krakow. To obtain concentrations of measured compounds the mathematical procedure has been used, where concentrations were calculated using a five points Lagrange’s interpolation method. Using temporary measurement data were determined daily arithmetic means and their standard deviations. Based on these data, efficiency of Montreal Protocol legislation, implemented in Poland (The Journal of Laws No. 52) could be assessed [2]. Additionally cut-off filtration method was used to estimate trend of the base line of individual air pollutant. Rejected exceedances of base lines were correlated with meteorological characteristics of Krakow region to evaluate possible sources of pollution.

The authors wish to acknowledge Prof. R. Weiss from Scripps Oceanography Institute (CA, USA) for preparing of the CFC’s primary standard (SIO1993) and Dr M. Maiss from Max-Planck Institute (Germany) for SF6 calibration. Authors also thanks Prof. S. O’Doherty from University of Bristol (England) and Prof K. Rozanski from AGH University of Krakow (Poland) for calibration of the CFC’s standard (SIO₂005). The research leading to these results has received funding from the European Community’s Seventh Framework Programme (FP7/2007-2013) in the InGOS project under grant agreement n° 284274. The project is financed by the Polish National Science Center on the basis of Decision No. DEC-2011/01/N/ST10/07621.

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