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Fifteen years of CFCs and SF6 measurements in air of Krakow, Poland

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The concentrations of chlorofluorocarbons (CFCs) and sulphur hexafluoride (SF_6) in the atmosphere are on the ppt level. CFCs are stable, synthetic, halogenated alkanes and they contribute to ozone depletion by photolytic processes in the stratosphere [1]. CFCs an SF_6 also participate in intensification of the greenhouse effect. The production and release of CFCs increased rapidly between the 1970s and 1980s. Then decreased dramatically from the end of the 1980s because of the Montreal Protocol limitations [2].

The measurements of CFCs and SF_6 in air are usually conducted at the so-called clean stations, i.e., at places situated outside of the urban areas influence. In Europe such clean station is the Mace Head (Ireland), which is AGAGE participant since 1987 [3]. In central Europe such measurements are carried out in densely populated urban area of Krakow since 1997. Very interesting is diminishing frequency of the seasonal variability of CFCs concentration pollution events after the date of 1.07.2002 when the Montreal Protocol legislations were implemented in Poland (The Journal of Laws No. 52). This suggests that the most observed sources of CFCs have been localized to the territory of Poland (the wind and air mass movements have still the same statistical character in Krakow region, as before legislation implementation) [4].

The work presents a general view of environmental pollution of Krakow air (in the years 1997-2012) by selected halocarbons i.e., freons F-11 ($CFCl_3$), F-12 (CF_2Cl_2), F-113 (CCl_2FCClF_2), chloroform ($CHCl_3$), 1,1,1-trichloroetane (CH_3CCl_3), carbon tetrachloride (CCl_4) and SF_6.

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