

4.115 Impact of densely populated area of Krakow (Poland) on CFCs and SF₆ concentration in the atmosphere.

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Abstract:

The concentrations of chlorofluorocarbons (CFCs) and sulphur hexafluoride (SF₆) in the atmosphere are on the ppt level. CFCs compounds are synthetic, stable, and they contribute to ozone depletion in the stratosphere. CFCs and SF₆ also participate in intensification of the greenhouse effect. Due to this fact, measurements of CFCs and SF₆ in air were started. They are usually carried out at places situated outside of urban areas influence ("clean stations"). In Europe such clean station is Mace Head (Ireland), which participates in AGAGE program since 1987 and in InGOS program till 2016. This kind of research is also conducted in Central Europe, in densely populated area of Krakow (Poland) since 1997. Within this work regression filtration of Krakow data was did, to pull the base line of individual compounds and to estimate its tendency. Then, the comparison with AGAGE data (Mace Head) was made. On this basis, it can be told that in Krakow, concentration of selected compounds is superposition of base line, typical for this part of Europe, and the local, incidental fluctuations. It is observed, that after 1.07.2002, when the Montreal Protocol legislations were implemented in Poland (The Journal of Laws No. 52), frequency of seasonal variability of CFCs concentration pollution events are diminishing. The concentration of CFC11 (CFCl₃), CFC12 (CF₂Cl₂), CFC113 (CCl₂FCClF₂), chloroform (CHCl₃), 1,1,1-trichloroetane (CH₃CCl₃), carbon tetrachloride (CCl₄) has a tendency to decrease, whereas sulphur hexafluoride (SF₆) tend to increase, which quite good agreed with data from Mace Head. Additionally, to show probable origin of these pollutants, meteorological characteristics of Krakow region was analysed.

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