



## **Influence of oxydo-reduction potential conditions for methane release rate from peat soils**

Z. Stepniewska<sup>1,2</sup>, A. Szafranek<sup>1</sup>

<sup>1</sup>Catholic University of Lublin, Department of Biochemistry and Environmental Chemistry, al. Kraśnicka 102, 20-718 Lublin, Poland, tel. (+48) 81 445 46 15, fax (+48) 81 445 46 10, (E-mail: szafik@kul.lublin.pl)

<sup>2</sup>Institute of Agrophysics PAS, ul. Doświadczalna 4, 20-290 Lublin 27, Poland

Methane is a very important greenhouse gas with absorption bands in the infrared region. Its concentration in atmosphere is estimated as 1.8 ppmv (part per million by volume) and increase about 0.5% to 1% per year from last century. It is also consider the most abundant reactive trace gas in the troposphere, its reactivity is important to both tropospheric and stratospheric chemistry. For that reasons it has been reported in about 20% participation to the greenhouse effect. Among sources of methane emission significant space are occupied by wetlands.

Peat soils characteristic high potential to create atmospheric methane, high humidity and content of organic matter. Methane is formatted as a final product of energetic process lead by methanogens, absolute anaerobic archebacteria, with presence of organic matter at low oxydo-reduction potential conditions ( $E_h < -200$  mV). This conditions often occurring in peatlands and for that reasons are consider as a one of significant source of methane emission among natural sources.

The aim of the paper was to investigate methane release rate from soil samples taken from different level of the peat profiles, in relation to redox potential. The measurements were performed in samples taken from peatlands profile in laboratory experiment. The samples were taken from Łęczyńsko-Włodawskie Lake District in the middle-east part of Poland and as a fresh one samples (1000 g) were placed in incubation vessels at full saturation condition and incubated for 250 days at 20°C. The gas

samples from head space were taken in 7 days period of incubation time and analysed by using gas chromatography technique, at the same time measurements the redox potential were performed. It was shown that Eh potential in peat samples was in the range + 136 to -324 mV during experiment time and methane concentration was increasing up to 15239 ppm showing big differences between localization of peats.