

## **Monitoring at the Ukraine-Romania Cross-Border Region in Teaching Methods of Environmental Sciences**

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Between July and November 2014 project expert group from State High Educational Institution «Precarpathian National University named after Vasyl Stefanyk» was held clean air mobile monitoring campaign in Ivano-Frankivsk region. During the monitoring campaign following parameters were measured: the contents of carbon oxide, carbon dioxide, sulfur dioxide, nitrogen dioxide, hydrogen sulfide, formaldehyde, alpha-, beta-particles and gamma radiation contamination in the area. For this purpose were used 5 automatic analyzers «DOZOR C-P" for each of the above gases individually, certified and produced by NPP "Orion" m. Kharkiv Ukraine and the appropriate dosimeter-radiometer. The principle of automatic analyzers «DOZOR C-P" is based on electrochemical or infra-red method of detection and each of these six gases individually in the natural atmosphere of the analyzed air [2].

As shown by measurements in more than 200 cities and villages of Ivano-Frankivsk region the expert group from the university has overcome more than 1500 km and visited all parts of the Ivano-Frankivsk region. Mainly air at the region is clean and complies with the regulatory parameters according the laws of Ukraine. The exception was the village Broshniv (Rozhnyativ District), where revealed numerous exceeding of maximum permissible concentration for formaldehyde (daily average maximum permissible concentration in the air of localities - 0,003 ppm, or mg/m<sup>3</sup>). Formaldehyde included in the group of chemical carcinogens and has general toxic effect at a concentration 0,012 mg/m<sup>3</sup> and discovers allergenic effect at a concentration 0,011 mg/m<sup>3</sup>. MPC of formaldehyde in water - 0.05 mg/L, in the breathing zone for workplaces - 0,035 mg/m<sup>3</sup>. Lethal dose 35% solution of formaldehyde is 10 ... 50 grams. [3].

Obtained data were used in teaching environmental sciences at the Institute of Natural Sciences State High Educational Institution «Precarpathian National University named after Vasyl Stefanyk»

1. Clean Air Management in the Romania-Ukraine Transboundary Area (CLAMROUA), registration number: HUSKROUA 1101/127 approved by the Joint Monitoring Committee of the Joint Operational Programme Hungary-Slovakia-Romania-Ukraine European Neighbourhood and Partnership Instrument Cross-border Cooperation Programme. — 8 p. 2013.
2. Instruction of gas analyzer «DOZOR C-P". Developed by "SPE ORION" / S.Yu.Sokolov. - M. Kharkov Ukraine - 13 p..
3. Formaldehyde - Living Planet. <http://www.ecolabel.org.ua/slovnuk/276-s.html>.