

***DESIGN OF AN OPTICAL METHANE CONCENTRATION METER,
INVARIANT TO TEMPERATURE CHANGES OF MINE ATMOSPHERE***

The authors have proposed a method of compensating for temperature drift of the output signal of an optical methane concentration meter for mine atmosphere conditions. This method, unlike the existing ones, uses only a voltage drop signal on the light emitting diode for hardware compensation, while software compensation is done after its changes. That made it possible to completely abandon hardware differential circuit design of the meter and an additional temperature sensor. Experimental prototypes of the methane concentration meter based on the proposed method have been designed and produced. While conducting studies of the prototypes, the authors have established the value of additional error of methane concentration measurement with temperature changes in the range from +5 to +35°C, which is not more than ± 0.1 vol.% in the range from 0 to 5 vol.%. The result is twice less than regulatory requirements, so the proposed method allows obtaining measurement results of methane concentration which are invariant to temperature changes.