IR detector for hydrocarbons concentration measurement in emissions during petroleum and oil products storage and transportation

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ABSTRACT

A double beam IR detector is developed for light hydrocarbons concentration measurement in emissions from storage vessels during oil and oil products storage and transportation. It was concluded on the basis of chromatogram that main crude losses from evaporation are the share of hydrocarbons light ends from methane to decane. Detector operation is based on spectral transparency measurement in the infrared spectra absorption range. Operational wavelength of infrared radiation makes 3.4 μm. measurement principle is based on concentration calculation proceed from molecule absorption cross-section, optical path length between light emitted diode and reference and signal photodiodes as well as from value of measured signal transmitted through gaging volume. The novel of offering device is an actual paraffin hydrocarbons concentration measurement in emissions and continuous and automatic environment quality control.

Key words: oil and oil products storage and transportation, hydrocarbons evaporation, hydrocarbons concentration measurement in the infrared spectra absorption range.