

3.6. OPTICAL-ECOLOGICAL MONITORING

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The interaction of light and various atmospheric components has been described well by many theoretical or empirical relationships. This approach opens a wide prospect for efficient use of optical diagnostic methods for monitoring of atmospheric air pollution. This reviews the most common atmospheric phenomena and optical effects, which regularities are used by the optical diagnostic methods to measure or indicate atmospheric characteristics.

The variety of different molecule energy components preconditions a rather complicated system of molecule energy levels, and therefore a complex spectrum of absorption. Molecular absorption lines, which are closely spaced and grouped in a certain manner, make up so called absorption bands. Due to complicated overlapping of absorption bands and lines, by various gases, interpretation of these lines and bands still remains a challenging scientific problem.

For the purpose of resolving diagnostics problems, the following types of equipment are used: gas analyzers, aerosol indicator, and spectral radiometers. For atmosphere monitoring photo- and tele- spectrometers, fluorescent lidars are often used for aquatic habitat and "MIR" space station testing.