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## RESEARCH ON ENVIRONMENTAL POLLUTION IN THE INDUSTRIAL AREAS OF ROMANIA

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### Abstract

The complex impact of exposure to pollution is examined, highlighting the need to understand the combinations of pollutants and their effects on the environment and human health, particularly through the lens of synergy. In this context, industry is recognized as a major source of emissions, with various activities and substances contributing to the deterioration of air quality. An approach for evaluating the impact of pollution through the principle of critical energy is presented. According to this principle, the total effect is obtained as the sum of the effects produced by the action energies. Consequently, the total effect results from the cooperation of multiple external and/or internal actions through the superposition and/or cumulation of their effects, taking into account dimensionless quantities, dependent on the behavior law.

The evolution of industrial emissions in Romania between 2007 and 2022 is analyzed, highlighting a significant reduction in pollutants, especially SO<sub>x</sub> and PM<sub>10</sub>, largely due to the implementation of strict regulations and the application of the best available techniques in the industrial sector. However, continued efforts are essential to improve air quality, given the impact of industry on the environment and public health, which can be amplified by the synergistic effects of some pollutants released into the atmosphere.

**Key words:** industrial emissions, multiple pollution, principle of critical energy, synergy

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