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CONSIDERATION REGARDING GASEOUS EMISSIONS INCINERATION OF HOUSEHOLDS WASTE FROM MARAMUREȘ COUNTY, ROMANIA

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Abstract

This study is part of an international project titled "Energy Recovery from Municipal Solid Waste by Thermal Conversion Technologies in Cross-border Regions." Household waste samples for the experiments were collected from a landfill in Maramureș County, Romania. While previous research has outlined optimal incineration conditions for energy recovery, this paper focuses on the environmental impact of incineration, particularly gaseous emissions. Although incineration is an efficient method for waste disposal, it significantly impacts the environment through the release of gaseous emissions, slag, and ash. Effective management of these emissions is crucial to mitigate environmental and health risks, necessitating a detailed understanding of emission characteristics based on waste composition and combustion conditions.

This paper presents a quantitative analysis of key pollutants in the gaseous emissions, including nitrogen oxides (NO_x), sulfur dioxide (SO₂), particulate matter (PM₁₀), and volatile organic compounds (VOCs), specific to the sampled waste. The analysis was conducted using advanced gas analysis equipment during controlled incineration experiments. The results revealed high concentrations of NO₂ and PM₁₀, exceeding the threshold values set by the European Directive 2008/50/EC on air quality standards. To address the pollution from the incineration plant, the study recommends implementing a purification system focused on reducing suspended dust and neutralizing nitrogen oxides. These findings highlight the necessity for stringent emission control measures to minimize the environmental and health impacts associated with waste incineration.

Key words: gaseous emissions, incineration, municipal solid waste, particulate matters

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