LITHUANIAN ENERGY INSTITUTE

ADMISSION TO PHD STUDIES FOR THE YEAR 2026

DOCTORAL RESEARCH TOPIC:

Investigation of plasma involved processes for converting various types of waste into valuable secondary raw materials and gases

RESEARCH FIELD:

Energetics and Power Engineering (T 006)

BRIEF DESCRIPTION OF RESEARCH TOPIC:

As global resource consumption continues to rise, the amount of waste generated is also increasing significantly. Effective waste management, recycling, and the implementation of various strategies have become urgent priorities for modern society. Traditionally, waste is often recycled using thermal methods. However, there are specific waste categories whose treatment is inefficient and poses a threat to both the environment and human health. Plasma processing technologies play a crucial role in waste recycling by achieving extremely high temperatures and activation energy levels, ensuring short reaction times, decomposing and neutralizing hazardous pollutants, and extracting valuable solid materials and synthetic gases for secondary use. Solid products such as vitrified slag, microfibers, granules, and composite coatings can be utilized in a wide range of applications. In addition, no secondary pollutants are formed during the waste decomposition process. Additionally, the plasma decomposition process does not produce secondary pollutants. Due to these advantages, plasma technologies are viewed as an advanced and promising method for waste management. However, there is currently a lack of fundamental knowledge about the processes that occur in plasma when decomposing various materials and extracting useful products from them. This study focuses on the application of atmospheric pressure plasma technology in waste treatment and recycling processes.

The aim of this work is to investigate the decomposition processes of different waste materials in a plasma environment, determine the optimal conditions for the conversion process, and analyze the underlying regularities and mechanisms.

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