



# AVVISO DI SEMINARIO

Il giorno 18 settembre alle ore 12.00

nell'aula **12**

La Prof.ssa **SID Asma Nour El Houda**

terrà un seminario dal titolo

**“Thermal Degradation of Plastic Waste (PET, HDPE case)”**

Proponente: Prof.ssa Marilena Carbone



## Thermal Degradation of Plastic Waste (PET, HDPE case)

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### Abstract

Plastic waste represents a major environmental problem of our time due to its bulky and unsightly nature, necessitating innovative solutions to reduce its negative impact on the environment. This thesis focuses on converting this waste into a fuel source, providing an ecological and economical solution. The main objective of this research is to explore one of the available methods for this conversion, partial pyrolysis. Two simple semi-closed reactors were constructed and used for this reaction at a temperature exceeding 500°C at the University Salah Bounider Constantine 3, Faculty of Process Engineering. Additionally, various experiments were conducted under optimal conditions using two types of polymers to evaluate their valorization potential: high-density polyethylene (HDPE) and polyethylene terephthalate (PET). Before these experiments, these polymers were subjected to thermogravimetric analysis (TGA) to study their thermal decomposition. The experimental results confirm that the properties of the products obtained are similar to those of gasoline for PET and diesel for HDPE, illustrating the capability of this process to convert plastic waste into usable hydrocarbons. Additionally, a simulation of the thermal degradation process of HDPE was performed using HYSYS software, providing an approximate modeling of reality. Further research is necessary to improve the partial pyrolysis process used to make it more efficient and sustainable. The goal is to optimize the production of high-quality fuels while minimizing the environmental impacts associated with this process.

**Keywords:** Plastic waste, conversion, HDPE, PET, partial pyrolysis, fuels.