TITLE OF THESIS : ***« Application of acoustic cavitation to the pre-treatment of lignocellulosic biomass from flax and the development of catalysts for catalytic reforming.»***

ABSTRACT :

In the current environmental context of climate change due to greenhouse gases emissions, the need to develop alternative, non-fossil energy sources has become a priority. Among these, lignocellulosic biomass is a promising alternative for biogas production. In this work, we aim to valorize flax shives, co-products of the flax industry, for the production of clean energy by applying ultrasonic technology to two stages of the biogas production process, upstream and downstream of anaerobic digestion. Firstly, we looked at the ultrasonic optimization of flax shives pretreatment and compared these results with conventional treatment methods (NaOH, H2O2, Fenton). Secondly, hydrotalcite-based catalysts (Ni-Co-Mg-Al-La) for dry reforming of methane were prepared under ultrasounds. The results obtained showed an enhancement in the structural characteristics of these materials compared with conventional synthesis methods, leading to improved CO2 and CH4 conversion rates.