

Optimization of spinel synthesis method for thermal energy storage applications

Matteo BATTAGLIA – *Tor Vergata University of Rome*

The activities led to the development and characterization of a mixed oxide of manganese and aluminum ($\text{MnAl}_2\text{O}_4/\text{MnAl}_2\text{O}_{4-\delta}$, spinel structure), a particularly promising thermal energy storage material, both in terms of cost and environmental impact and in terms of chemical and physical stability, able to store and release heat at temperature (550-700 °C). The spinel synthesis method has been optimized changing different parameters during the fast firing (FF) process, like calcination temperature and time. Moreover, the features of the selected material have been improved by doping the crystalline structure and supporting it with inert substrates to enhance energy density and stability over thermochemical cycles.

Acknowledgments: the activities were carried out in the PTR 2022-24—Objective: Technologies—Project 1.2/WP4 National program.