CHAPTER 3
OBJECTIVE OF THE PRESENT RESEARCH

The present work involves blending the paraffin wax fuel with PE and metal additives, mainly Al and B powder, to study the combined binder/additive behaviour. The thermal decomposition and combustion of paraffin-based solid fuels has been investigated using DSC to study static combustion effect. The experiments were carried out at a varied loading of additive/binder composition to monitor the effect of additive loading in the heat release during the combustion and pyrolysis process. Besides, the kinetic studies were carried out for a fixed loading of metal additives.

The mechanical characterization was performed to analyze the tensile and compression strength and respective modulus. The ignition behaviour and combustion characteristics of these fuels were examined by TG/DTG/DSC technique to evaluate the possible relevant changes triggered due to PE, Al and B addition. The rheological investigation was carried out to predict the sensitivity of PE, Al and B additives concentration on viscosity of paraffin-based fuels. Lastly, the effects of addition of Al, B and PE on regression rate and combustion efficiency of paraffin-based fuels was investigated.