**Abstract**

In order to recover energy and recycle waste materials, an experimental study was
performed on utilization of waste materials in catalytic steam gasification system. In
current research, an alternative method of hydrogen production is achieved by blending
of palm kernel shell (PKS) with waste tyre as a promising energy resource. Experiments
were carried out at 600-800ºC with steam/feedstock ratio (S/F) of 2-4 (kg/kg) and waste
tyre/PKS ratio of 0-0.3 (kg/kg). This paper reports the results obtained from series of
experiments that have been performed, on a pilot plant to improve hydrogen production
efficiency. The highest H2 and total syngas content of 66.15 vol% and 83.8 vol% was
achieved respectively under condition of 800ºC and 30 wt% of waste tyre blended with
PKS and S/F ratio of 4 (kg/kg). The results obtained confirmed that mixtures of PKS and
waste tyre in catalytic steam fluidized bed system produced a fuel gas with a calorific
value of 14.76 MJ/Nm3 which has the potential to be utilised in engines.