

## **Abstract**

The production of hydrogen as a clean and sustainable fuel is becoming attractive due to the energy crisis and increasing environmental issues associated with fossil fuel usage. Biomass steam gasification with in situ carbon dioxide capture has good prospects for the production of hydrogen rich gas. Furthermore, hydrogen yield can be enhanced using catalyst steam gasification. This chapter comprised the literature review on the both approaches i.e. experimental and modelling used to study the hydrogen production from biomass gasification specifically using pure steam as gasification agent. There were several modeling approaches for gasification process based on the kinetics, equilibrium and the fluid dynamics behaviors. A detailed discussion has been carried out in this chapter on modelling and simulation for hydrogen production from biomass based on kinetics modelling. Experimental studies have been published on steam gasification, steam gasification with CO<sub>2</sub> capture and catalytic steam gasification has been discussed. Gasification for hydrogen production from Oil palm empty fruit bunch (EFB) has also discussed.