## Chemistry of Catalytic Hydrothermal Gasification

## Partial equations:

$$C_6H_{10}O_5 + H_2O \rightarrow 6CO + 6H_2$$
 (steam reforming of carbohydrate)  
 $CO + 3H_2 \rightarrow CH_4 + H_2O$  (methanation)  
 $CO + H_2O \rightarrow CO_2 + H_2$  (water-gas shift)

The overall stoichiometry is then:

$$C_6H_{10}O_5 + H_2O \rightarrow 3CH_4 + 3CO_2$$

Note: Feedstocks contain many molecular structures, including carbohydrates, proteins, etc. The actual gas products will usually contain a small amount of hydrogen and ethane as well as methane and carbon dioxide.

