

Fuel characterization

Group 5

Hao Wu
Kavitha Pathmanathan



Outline

- Introduction
- Method
- Result and discussion
- Conclusion



Introduction

Ash related problems in biomass combustion



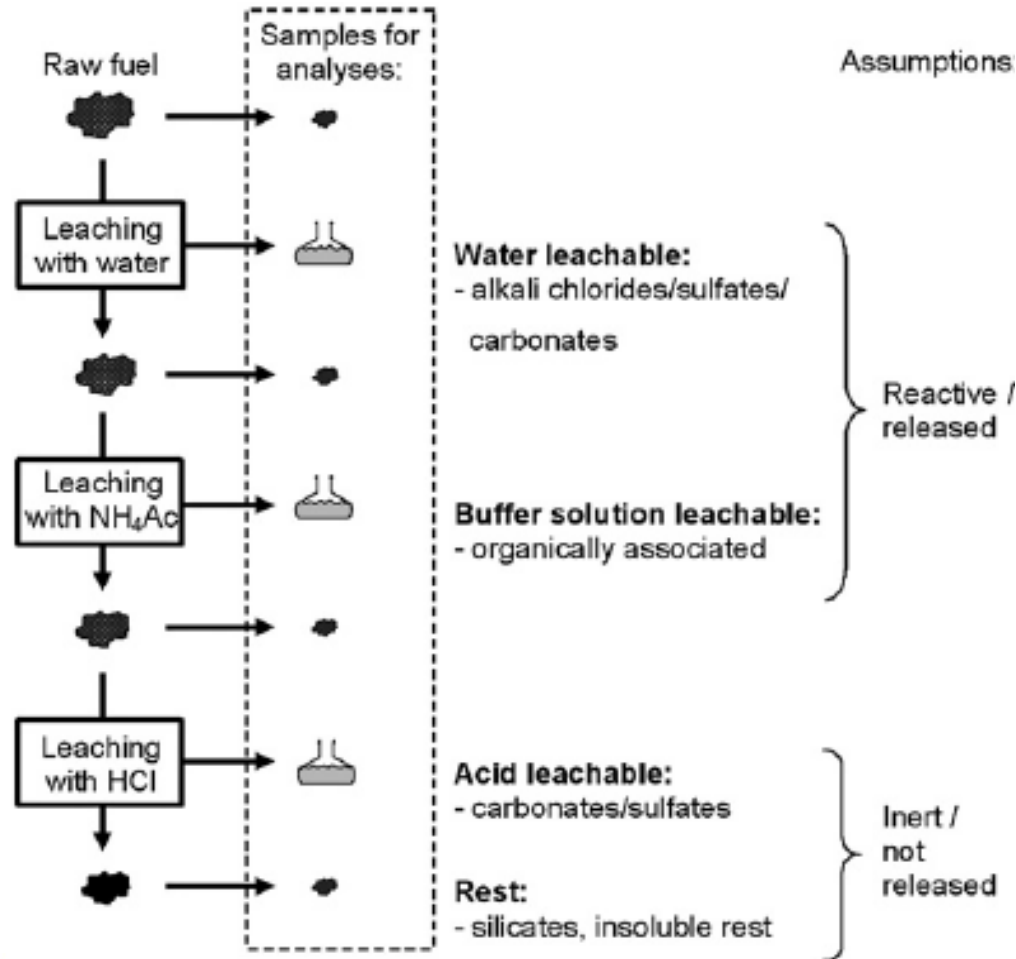
Understand and predict the ash behavior



Characterization of ash forming matters



Method - Chemical fractionation



Fuels



Wood chips

(Ash content: 0.4 wt% dry)

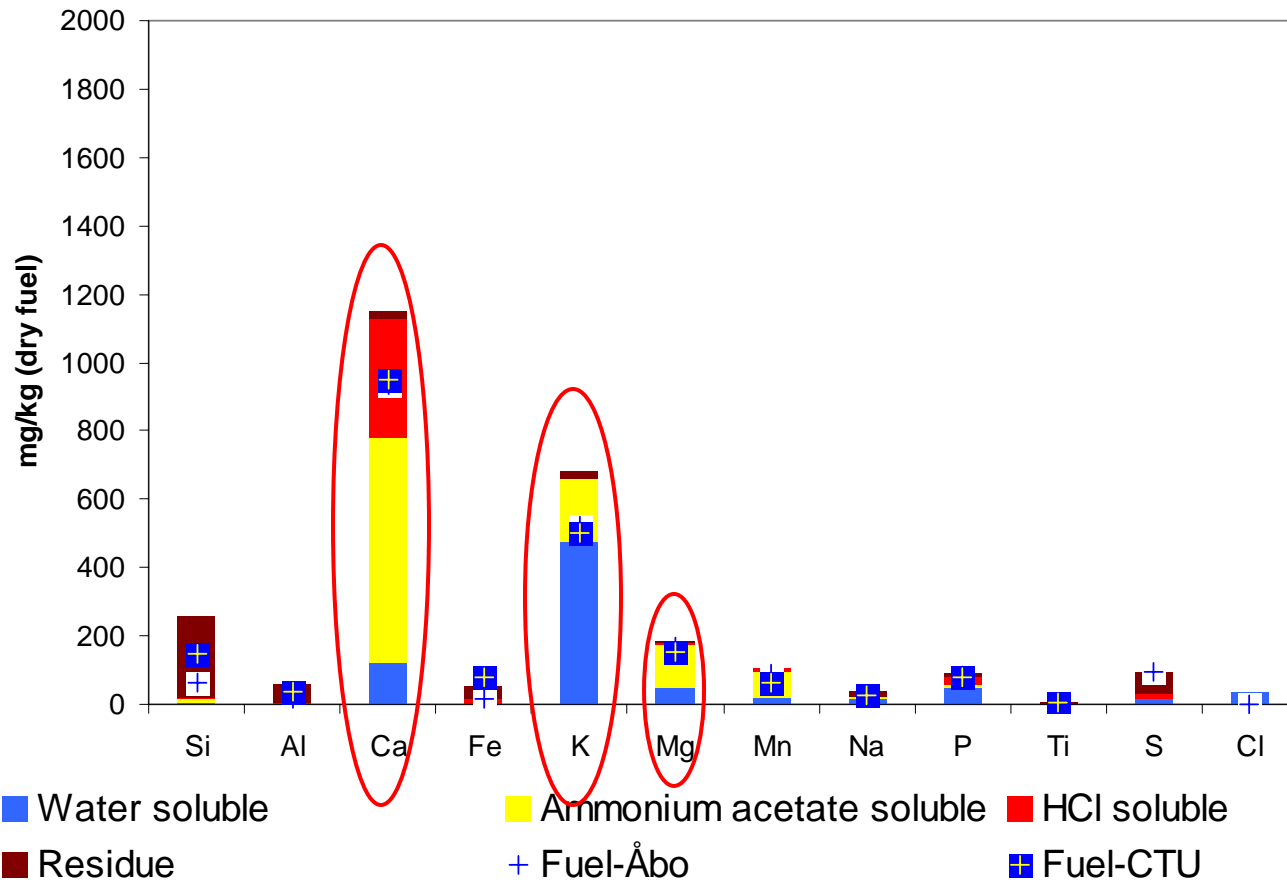


Straw pellets

(Ash content: 3.8 wt% dry)

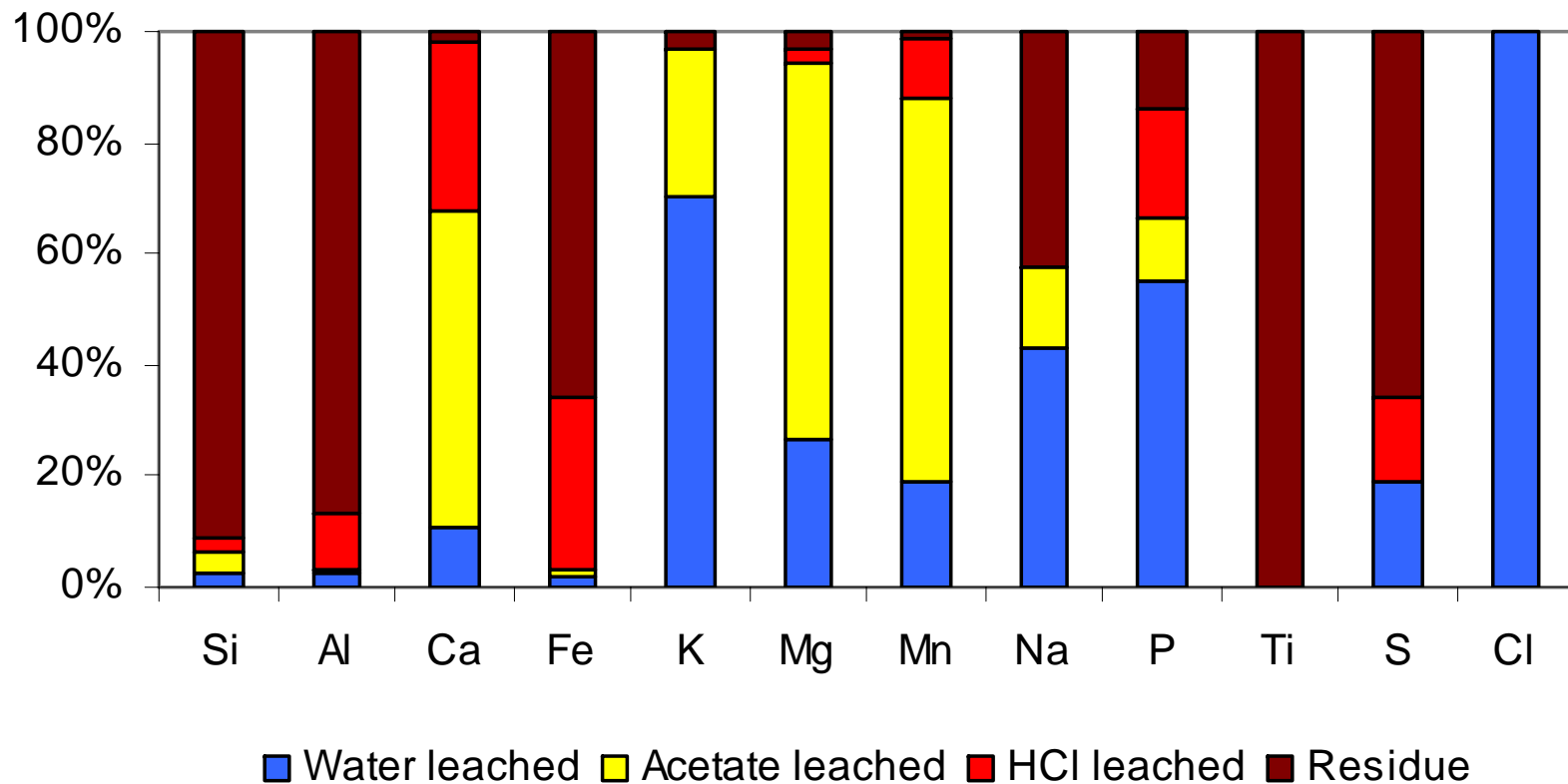


Result-wood chips

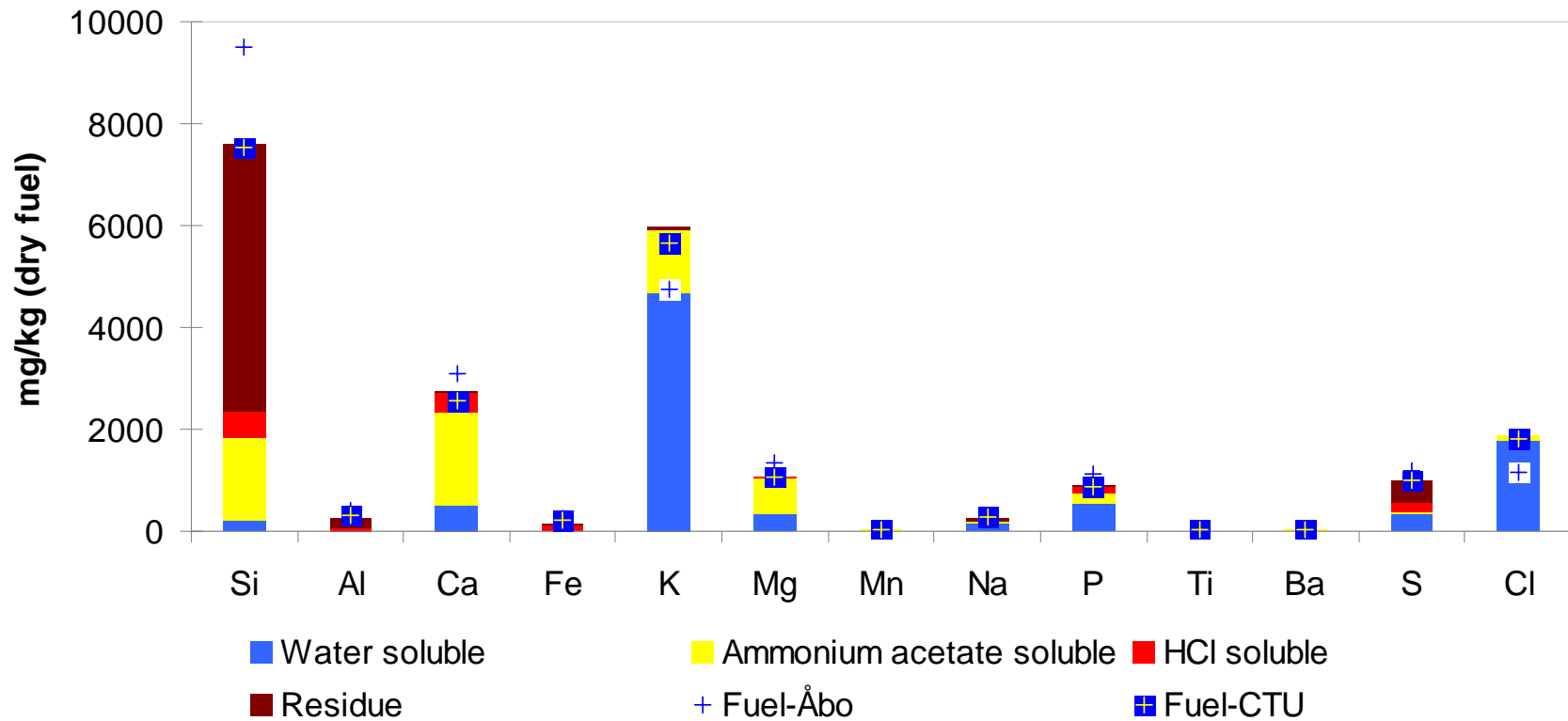


Group 5 – Fuel Characterization

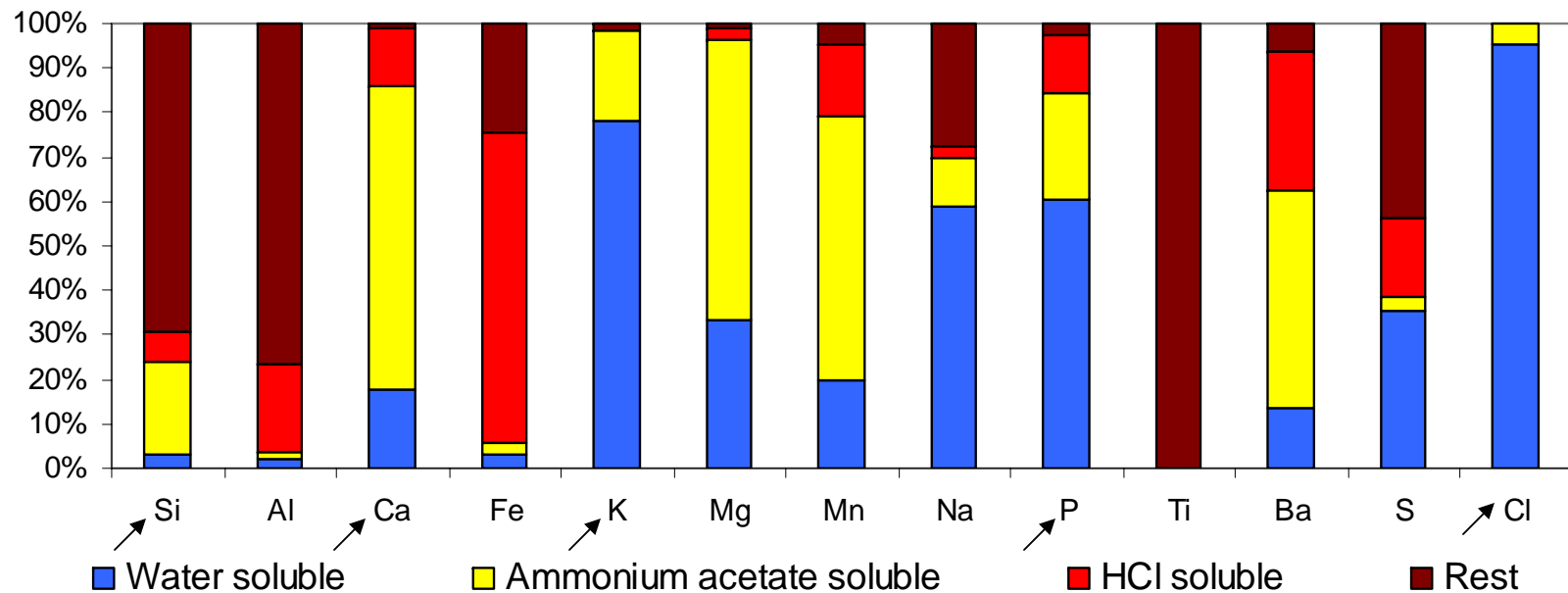
Distribution of inorganic elements in wood chips



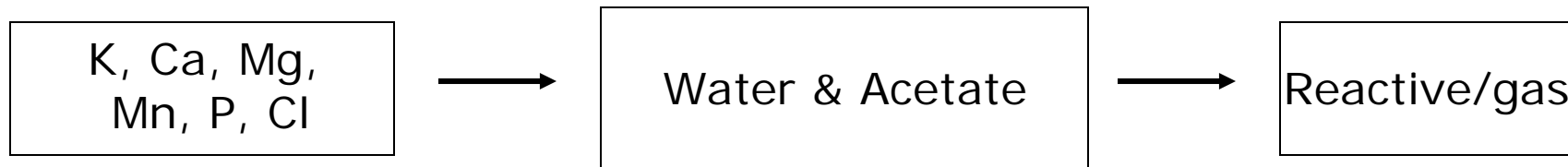
Result-straw pellets



Distribution of inorganic elements in straw pellets



Discussion-overall observation



Will this really happen in combustion?



Possible Limitations

- Element
 - Si, Al, Cl
 - S
- Fuel
 - Coal
 - Biomass
 - Waste
- Combustion technology
 - Fixed bed combustion
 - Fluidized bed combustion
 - Pulverized fuel combustion



Conclusion

- Chemical fractionation method provides information on the association of inorganic elements in the fuel
- This method alone is not sufficient to predict the ash behavior in combustion
- To understand and predict the ash behavior better, this method may be combined with lab-scale combustion experiments and thermodynamic calculations



THANK YOU FOR YOUR ATTENTION 😊



Group 5 – Fuel Characterization