Supplementary information (SI) for

Effects of ash composition and combustion temperature on reduced particulate matter emission by biomass carbonization

Davaajav Dalkhsurena, Kazunori Iwabuchib\*, Takanori Itohc, Takumi Naritaa, Mahmudul Islam Piasha, Baatarbileg Nachind, Gerelbaatar Sukhbaatarde

a Graduate School of Agriculture, Hokkaido University, Kita 9, Nishi 9, Kita-ku, Sapporo, Hokkaido 060-8589, Japan

b Research Faculty of Agriculture, Hokkaido University, Kita 9, Nishi 9, Kita-ku, Sapporo, Hokkaido 060-8589, Japan

c Tanigurogumi Corporation, Shiobara 1100, Nasushiobara, Tochigi 329-2921, Japan

d The Institute of Forestry, National University of Mongolia, Ulaanbaatar 14201, Mongolia

e Department of Environment and Forest Engineering, National University of Mongolia, Ulaanbaatar 14201, Mongolia

\* Corresponding author. E-mail address: iwabuchi@bpe.agr.hokudai.ac.jp (K. Iwabuchi)

This file includes Figs. S1, S2, and S3.



Fig. S1 Rice husk (RH) ash mineral content



Fig. S2 Rice straw (RS) ash mineral content



Fig. S3 Dairy manure (DM) ash mineral content