Supplemental Material for

Measurement and Modeling of Carbon Monoxide Emission Rates from Multiple Wood Pellet Types

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Nomenclature

[CO} is the gaseous mixing fraction of carbon monoxide

V_g is the total volume of the gas phase inside the drum.

k_{CO} = the rate constant of CO off-gassing

k_{OD} = the rate constant for any other O_2 depletion reactions

m_p = the total mass of stored pellets

w_{R-CO} is the unit amount of reactant (generating CO) on the pellet surface.

$w_{R-CO,T}$ is the total potential amount of CO-generating reactant on the pellet surface.

Table S1. Units of parameters or variables in the improved model develop

Parameter / variable	Dimension
[CO], [O_2]	$\frac{mol}{m^3}$
w_{R-CO} $w_{\text{R-CO}}$	$\frac{mol\ \text{Reactant}}{kg\ \text{pellets}}$
k_{CO}	$\frac{\sqrt{m^3/mol}}{s}$
k_{OD}	$\frac{m^3}{kg \cdot s}$
r_{CO}, r_{OD}, r_{O_2}	$\frac{mol}{kg\ pellets \cdot s}$

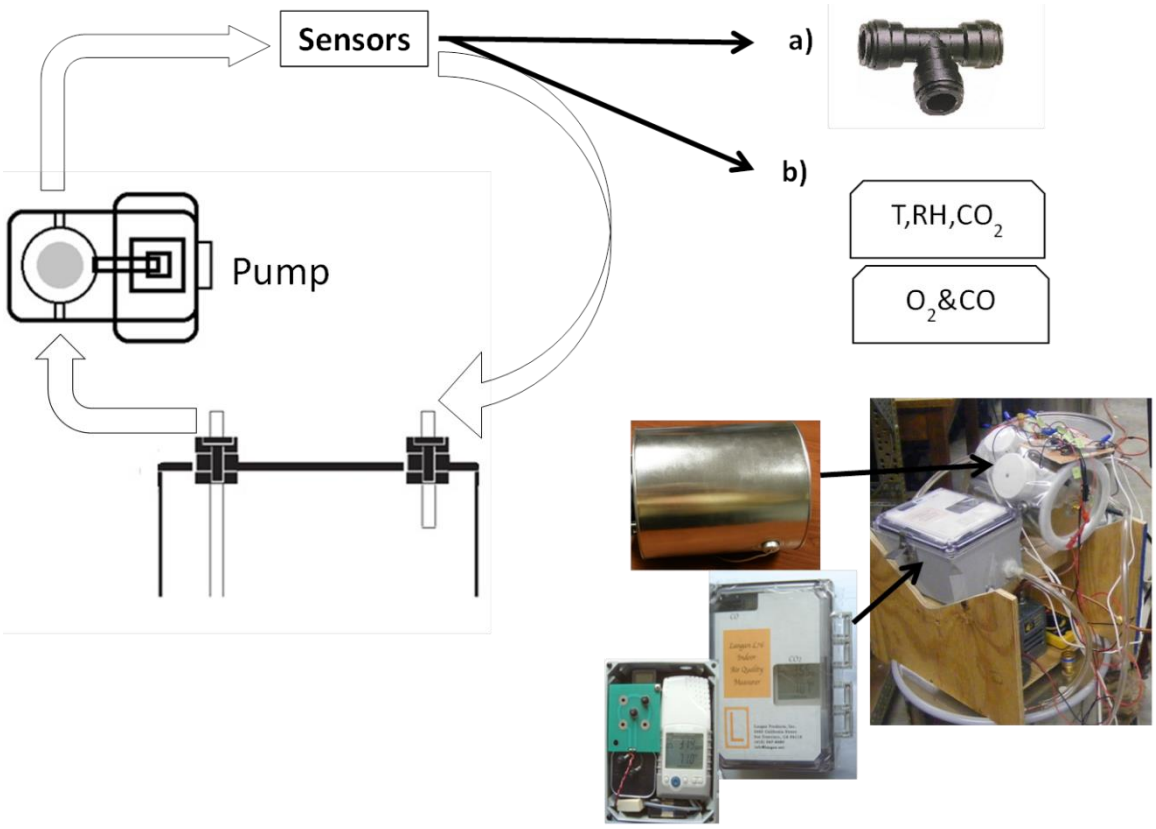

Figure S1. Recirculation system to get air samples used for the off-gassing experiments: **a**) first set of experiment using a T shape fit to the CO, O_2, and RH sensors; and **b)** second set up were the air loop pass through 2 boxes with CO, O_2, CO_2, T and RH sensors.

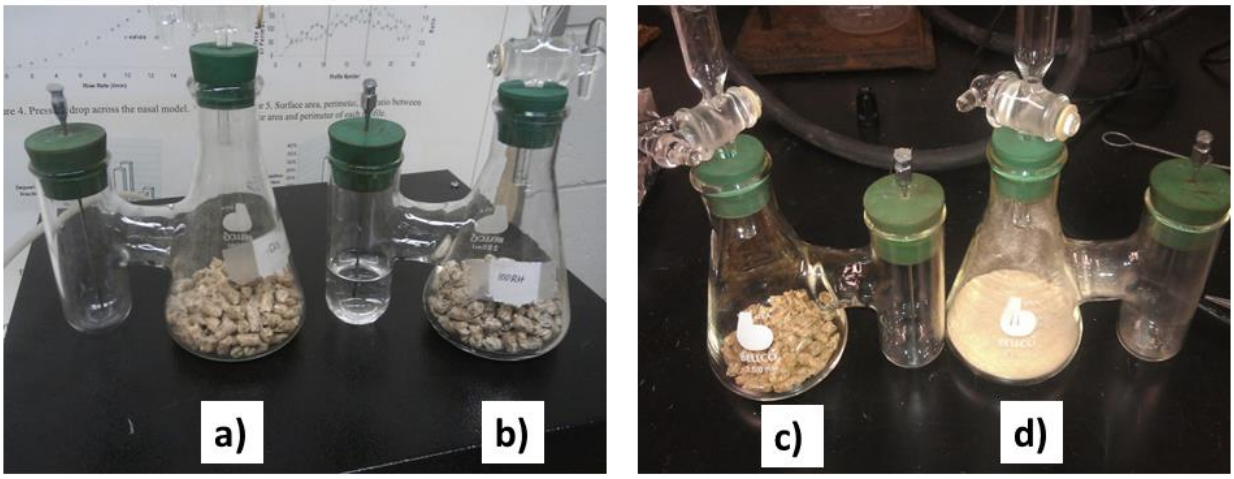

Figure S2. Photographs for the testing of Moisture Content and Surface Area effect in pellets by using Erlenmeyer flasks as storing chambers. Flask **(a)** loaded with dried pellets; Flask **(b)** contains liquid water; Flask **(c)** loaded with regular pellets; Flask **(d)** loaded with ground pellets.

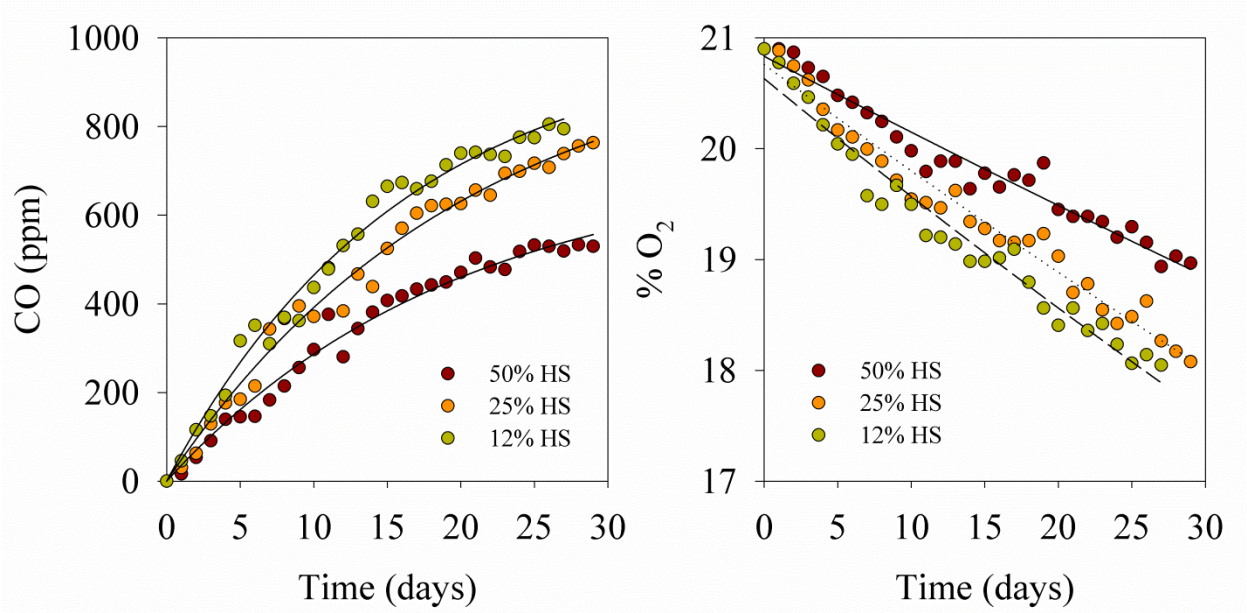

Figure S3. CO concentration and % O_2 as a function of time for 50%, 25% and 12% HS.

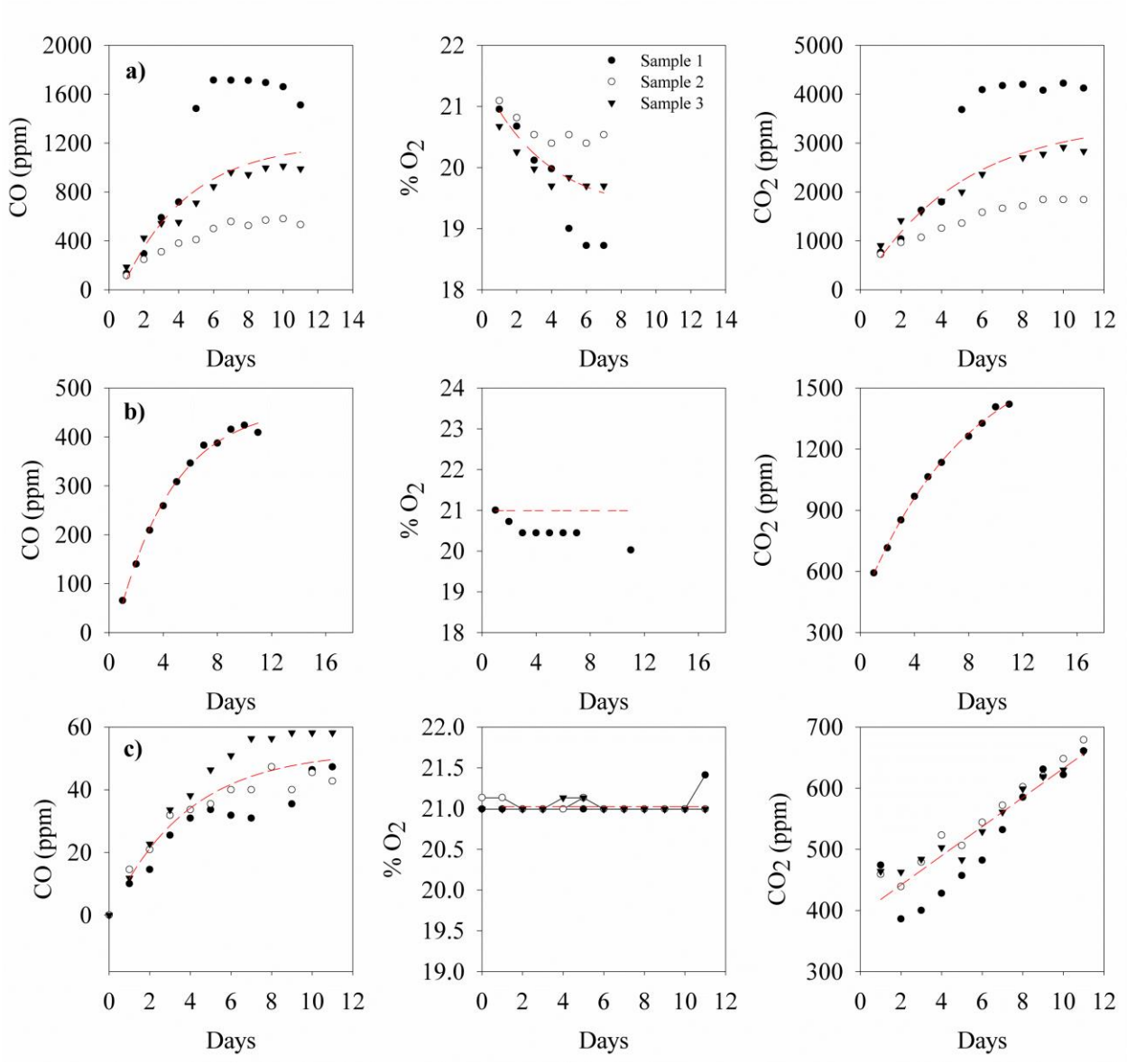

Figure S4. CO, O_2, CO_2 concentrations as a function of time for aged pellets (one month old) under three differents temperatures conditions: a) 30, b) 22, and c) 6-8°C..