

Supplementary Material

Table S1. Equipment mapping of sequential pretreatment schemes.

Equipment	Aspen Model	Remarks
Crusher	Crusher	Gyratory crusher
Sieve	Sieve	Rectangle sieve
Mixer	Mixer	Enclosed vertical tank
Reactor	RStoic	Agited tank – enclosed, jacketed
Heat exchanger	Heater	TEMA tube and shell exchanger
Filter	Filter	Rotary drum filter
Distillation Column	RadFrac	Multiple diameter, trayed or packed column
Pump	Pump	Centrifugal single or multi-stage pump
Compressor	Compr	Centrifugal air compressor with motor