Perancangan dan optimasi kinerja kompor gas-biomassa rendah emisi karbon monoksida berbahan bakar biopellet dari kayu karet = Design and optimization biomass-gas stove with low carbon monoxide emission using rubber wood pellet

Farah Inayati, author

Abstrak

[ABSTRAK
Mekanisme pembakaran pada kompor biomassa yang menyertakan pembakaran fasa padat dengan 1 blower pemasok udara masih menghasilkan CO di atas ambang batasnya, 25 ppm. Peneliti merancang kompor gas-biomassa dengan mekanisme pembakaran fasa gas saja menggunakan 2 blower pemasok udara primer dan sekunder, mengakomodasi preheating udara sekunder dan efek turbulensi. Penelitian bertujuan mendapatkan rancangan kompor biomassa dengan rasio udara terbaik sehingga dihasilkan emisi CO rendah dan warna api biru. Penelitian diawali dengan perancangan kompor lalu membakar gas pirolisis yang dihasilkan dari devolatilisasi biomassa. Kondisi terbaik kompor berdiameter dalam ruang pembakaran 15 cm dengan tinggi ruang pembakaran 58 cm adalah pada rasio aliran udara sekunder terhadap udara primer 6,29 dengan emisi CO rata-rata 14 ppm dan efisiensi termal 52,8 %.
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ABSTRACT
Existing biomass stoves using combustion in solid phase with 1 blower as an air supplier produce CO well above the minimum allowable CO emission (25 ppm). In this research, combustion mechanism occurs only in gas phase, the stove uses 2 blower as primary and secondary air supplier, accommodates preheating secondary air and turbulency effect. The objective of this research was to get biomass-gas stove design with the best air ratio that produces low CO emission and blue flame. First step of this research is to design he stove and then to burn pyrolysis gas produced of biomass devolatilization. The best condition of the biomass gas stove, which has dimension 15 cm inner diameter for combustion chamber and 58 cm height of combustion chamber is that the flow ratio of secondary air to primary air is 6,29 which has average CO emission at 14 ppm and thermal efficiency at 52,8%., Existing biomass stoves using combustion in solid phase with 1 blower as an air
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