

## BAB V

### CONCLUSIONS AND SUGGESTIONS

#### 5.1 Conclusions

The conclusions that can be drawn from this research are:

1. Emission factors (EFs) of size-fractionated PMs from rice straw with 11.11% moisture content burned in an open-system combustion chamber were 0.302 g/kg for  $PM_{>10\ \mu m}$ ; 2.987 g/kg for  $PM_{2.5-10}$ ; 10.991 g/kg for  $PM_{1.0-2.5}$ ; 2.933 g/kg for  $PM_{0.5-1.0}$ ; 0.166 for  $PM_{0.1-0.5}$  and 1.308 for  $PM_{<0.1\ \mu m}$ .
2. The average emission factors (EFs) values of metals present in the composition of size-fractionated PMs from rice straw burning in descending order were  $Ca > Na > K > Fe > Li > Zn > Mg > Bi$ . The highest EFs Ca was the most abundant metal element accounted 81.91% of total elements.
3. EFs generated in this study are more suitable for traditional harvesting practice where they piled up rice straw before burning, rather than the mechanical harvesting practice where farmers burn the spreaded rice straw at the field.
4. The total mass of rice straw being burned in the field (M) in Padang, West Sumatra for 2021 was 79,622.13 ton. The total emission of size-fractionated PMs emitted from rice straw burning in Padang, West Sumatra in 2021 was 24.046 ton for  $PM_{>10\ \mu m}$ ; 237.831 ton for  $PM_{2.5-10}$ ; 875.127 ton for  $PM_{1.0-2.5}$ ; 233.532 ton for  $PM_{0.5-1.0}$ ; 13.217 ton for  $PM_{0.1-0.5}$  and 104.146 ton for  $PM_{<0.1\ \mu m}$ . Total emission from rice straw burning in Padang, West Sumatra in 2021 for all size of particulate matters were 1,487.90 ton.
5. The total emission of metals bonded in size-fractionated PMs emitted from rice straw burning in Padang, West Sumatra in 2021 was 8,524.972 kg for Ca; 610.312 kg for Na; 369.431 kg for K; 394.455 kg for Fe; 91.263 kg for Li; 73.026 kg for Zn; 34.912 kg for Mg; 28.798 kg for Bi.

## 5.2 Suggestions

Suggestions that can be given for further research are:

1. Further research needs to be done with more accurate design of open-system chamber so that all emissions can 100% captured by the nanosampler.
2. Isokinetic sampling should be done properly by measuring the flue gas velocity at the chimney and adjust the velocity in the pumping system so the particulate would be completely captured by the sampling system.
3. Careful measurement of biomass burned in the chimney should be done to incorporate the remaining ash (unburned biomass) after burning experiment.
4. It is necessary for government to make official regulations that regulate emission quality standards from biomass burning, especially particulate matters emissions from rice straw burning.

