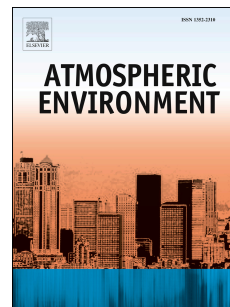


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Emissions of volatile organic compounds from maize residue open burning in the northern region of Thailand

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1 Emissions of volatile organic compounds from maize residue open burning 2 in the northern region of Thailand

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19 20 Abstract

21 Emission factors for speciated volatile organic compounds (VOCs) from maize residue
22 burning were determined in this study based on chamber experiments. Thirty-six VOC
23 species were identified by Gas Chromatography/Mass Spectrometer (GC/MS). They were
24 classified into six groups, including alkanes, alkenes, oxygenated VOCs, halogenated VOCs,
25 aromatics and other. The emission factor for total VOCs was estimated as about 148 mg kg⁻¹
26 dry mass burned. About 68.4% of the compounds were aromatics. Field samplings of maize
27 residues were conducted to acquire the information of fuel characteristics including fuel
28 loading, fraction of maize residues that were actually burned as well as proximate and
29 elemental analysis of maize residues. The emission factors were then applied to estimate
30 speciated VOC emissions from maize residue open burning at the provincial level in the
31 upper-northern region of Thailand for the year 2014. Total burned area of maize covered an
32 area of about 500,000 ha which was about 4.7% of the total area of upper-northern region of
33 the country. It was found that total VOC emissions released during the burning season

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