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Temperature threshold of biogenic isoprene emission in subtropical urban and suburban areas

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Measurement of speciated volatile organic compounds (VOCs) was conducted in a subtropical metropolis to investigate the characteristic of biogenic and anthropogenic isoprene, which deserves attention due to its extremely strong photochemical reactivity in producing ozone and secondary organic aerosols (SOA). Biogenic emissions possess a significant fraction of isoprene in the summertime, especially for subtropical cities. During nighttime, the observed isoprene showed a pretty good correlation with traffic-related tracer- 1,3-butadiene, indicating that nighttime isoprene is mostly anthropogenic. Thus, the observed ambient isoprene in the subtropical city was compared with 1,3-butadiene to estimate the biogenic fraction vs. the anthropogenic fraction during daytime. Furthermore, there seems to exist a temperature threshold, beyond which the biogenic fraction increases with ambient temperatures. The threshold varied with different areas and mainly depended on local plant species.