



Atmospheric oxidation of gaseous anthracene a..  
Atmospheric Environment, Volume 234, 2020, Article 1.

Purchase PDF

View details

Impact of long-range atmospheric transport on..  
Atmospheric Environment, 2020, Article 118093

Purchase PDF

View details

The hydrolysis of NO<sub>2</sub> dimer in small clusters o..  
Atmospheric Environment, Volume 243, 2020, Article 1.

Purchase PDF

View details

1 2 Next

Short communication

# Detection of a secondary organic aerosol tracer derived from personal care products

Alissia Milani<sup>a</sup>, Ibrahim M. Al-Naiema<sup>a, b</sup>, Elizabeth A. Stone<sup>a, c</sup>

Show more

+ Add to Mendeley Share Cite

<https://doi.org/10.1016/j.atmosenv.2020.118078>

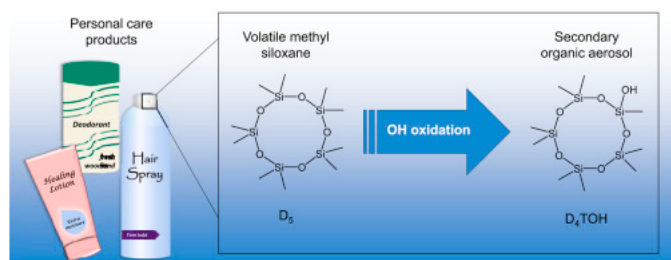
Get rights and content

Citing articles (0)

## Abstract

Decamethylcyclopentasiloxane (D<sub>5</sub>) is frequently used in personal care products (PCPs). In the gas phase, D<sub>5</sub> is oxidized to form 1-hydroxynamethylcyclopentasiloxane (D<sub>4</sub>TOH), which can partition to the particle phase. Numerous studies have reported secondary organic aerosol (SOA) formation via hydroxyl (OH) radical-initiated oxidation of D<sub>5</sub>. It is expected that PCPs have a significant impact on SOA, but the extent has not yet been investigated. To date, no studies have reported the occurrence of PCP-derived SOA in ambient particulate matter. This study examined fine particulate matter (PM<sub>2.5</sub>) collected in Atlanta, GA and Houston, TX and determined D<sub>4</sub>TOH was present in 28 of 29 and 33 of 46 ambient PM<sub>2.5</sub> samples, respectively. Gas chromatographic retention data in the form of the Kováts index is reported for the first time to aid others in identifying this compound in order to assess the impact of PCPs on SOA formation. The estimated concentration of D<sub>4</sub>TOH ranged from 16 to 185 pg m<sup>-3</sup> in Atlanta and 19–206 pg m<sup>-3</sup> in Houston. Synthetic musks were also detected in Atlanta and Houston PM<sub>2.5</sub> samples, which is consistent with PCPs impacting urban air quality. Because of its specificity and demonstrated detectability, D<sub>4</sub>TOH may be useful as a tracer of PCP-derived secondary organic aerosol.

## Graphical abstract



Download : Download high-res image (256KB)

Download : Download full-size image