

Accepted Manuscript

Gas-phase alkyl amines in urban air; comparison with a boreal forest site and importance for local atmospheric chemistry

H. Hellén , A.-J. Kieloaho , H. Hakola



PII: S1352-2310(14)00376-8

DOI: [10.1016/j.atmosenv.2014.05.029](https://doi.org/10.1016/j.atmosenv.2014.05.029)

Reference: AEA 12973

To appear in: *Atmospheric Environment*

Received Date: 20 January 2014

Revised Date: 6 May 2014

Accepted Date: 12 May 2014

Please cite this article as: Hellén, H., Kieloaho, A.-J., Hakola, H., Gas-phase alkyl amines in urban air; comparison with a boreal forest site and importance for local atmospheric chemistry, *Atmospheric Environment* (2014), doi: 10.1016/j.atmosenv.2014.05.029.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 Gas-phase alkyl amines in urban air; comparison with a boreal forest site and 2 importance for local atmospheric chemistry

3

4 Hellén H.^{a*}, Kieloaho A.-J.^b and Hakola H.^a

5

6 ^a*Finnish Meteorological Institute, Air Chemistry Laboratories, P.O. Box 503, FI-00101 Helsinki,*
7 *Finland*8 ^b*Department of Physics, P.O. Box 64, FI-00014 University of Helsinki, Finland*

9

10 *Corresponding author: H. Hellén (tel. +358-50-5242529, email: heidi.hellen@fmi.fi)

11

12 Highlights

13 *Several alkyl amines were observed in urban background air

14 *The concentrations of alkyl amines were higher in boreal forest air than in urban background air

15 * Amines strongly impacted local atmospheric chemistry

16

17 Abstract

18 Low-molecular-weight aliphatic amines were measured in the ambient urban background air at the
19 SMEAR III station (Station for Measuring Forest Ecosystem-Atmosphere Relations III) in Helsinki,
20 Finland, from May until late August 2011. The alkyl amines measured were dimethylamine (DMA),
21 ethylamine (EA), trimethylamine (TMA), propylamine (PA), diethylamine (DEA), butylamine
22 (BA) and triethylamine (TEA).23 Of these amines, DMA+EA and TMA+PA were the most abundant, with average concentrations of
24 24 and 8 ppt. The ranges of weekly mean concentrations of DMA+EA and TMA+PA were < DL
25 (9.5 ppt) – 55 ppt and 4--27 ppt. The concentrations of all amines in urban background air in
26 Helsinki were lower than at a boreal forest site (SMEAR II), indicating the presence at the latter site
27 of some additional sources. Amine lifetimes are short, varying from 2.3 h to 7.6 h against hydroxyl
28 (OH) radicals. The amine concentrations were scaled against OH reactivity and compared with the
29 OH reactivities of aromatic hydrocarbons and terpenes. The results showed that amines strongly
30 influenced the total OH reactivity, especially at the boreal forest site in May, September and
31 October, showing contributions almost as high as those of monoterpenes.

32

33 Keywords: Amines; urban air; OH reactivity; VOCs

Download English Version:

<https://daneshyari.com/en/article/6339551>

Download Persian Version:

<https://daneshyari.com/article/6339551>

[Daneshyari.com](https://daneshyari.com)