Atmospheric Chemistry and Physics
An Interactive Open Access Journal of the European Geosciences Union

Atmos. Chem. Phys., 9, 7387-7396, 2009
www.atmos-chem-phys.net/9/7387/2009/

Atmospheric hydrogen variations and traffic emissions at an urban site in Finland

T. Aalto, M. Lallo, J. Hatakka, and T. Laurila
Finnish Meteorological Institute, Climate Change Research, P.O. Box 503, 00101 Helsinki, Finland

Abstract. Atmospheric hydrogen (H_2) mixing ratios were observed over a one year period from summer 2007 to 2008 in Helsinki, Finland. Relatively stable background values of hydrogen were occasionally observed at the site, with minimum in October and maximum between March and May. High hydrogen mixing ratios occurred simultaneously with high carbon monoxide (CO) values and coincided with high traffic flow periods. Carbon monoxide and radon (^{222}Rn) were continuously monitored at the same site and they were used in estimation of the hydrogen emissions from traffic. The morning rush hour slope of $\Delta H_2/\Delta CO$ was in average 0.43±0.03 ppb (H_2)/ppb (CO). After correction due to soil deposition of H_2 the slope was 0.49±0.07 ppb (H_2)/ppb (CO). Using this slope and CO emission statistics, a road traffic emission of about 260 t (H_2)/year was estimated for Helsinki in 2007.

Final Revised Paper (PDF, 1343 KB) Discussion Paper (ACPD)

Citation: Aalto, T., Lallo, M., Hatakka, J., and Laurila, T.: Atmospheric hydrogen variations and traffic emissions at an urban site in Finland, Atmos. Chem. Phys., 9, 7387-7396, 2009. Bibtex EndNote Reference Manager