



## **One year of hydrogen sulfide (H<sub>2</sub>S) measurements in the city of Thessaloniki, Greece: High ambient levels due to traffic emissions**

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One full year (1995) of hydrogen sulfide measurements in an urban traffic site in the city of Thessaloniki were conducted by the Dept. of Environment, Municipal Authority of Thessaloniki. The concentrations were unexpectedly high, with a mean annual concentration of  $8 \mu\text{g}/\text{m}^3$  and a mean wintertime concentration of  $18 \mu\text{g}/\text{m}^3$ . During calm (wind velocity  $< 0.5 \text{ m/s}$ ) conditions, mainly encountered during nighttime hours, hourly values of H<sub>2</sub>S were correlated positively with those of CO ( $r^2=0.75$ ) and SO<sub>2</sub> ( $r^2=0.70$ ), pointing to a common traffic source. For the driving conditions of the measurement site, H<sub>2</sub>S automotive emissions are around 24 % w/w those of SO<sub>2</sub>, while European inventories calculate these at only 2.5 %. H<sub>2</sub>S annual traffic emissions, based on the existing emission inventories for CO and SO<sub>2</sub> are calculated at  $0.199 - 0.311 \times 10^{-3} \text{ Tg a}^{-1}$  for Thessaloniki and are extrapolated to  $0.030-0.0485 \text{ Tg a}^{-1}$  for the EU15 countries and  $2.6 \text{ Tg a}^{-1}$  for Europe and Eurasia. It appears that traffic emissions make up a significant contribution to the global H<sub>2</sub>S budget. These results might also be relevant to outdoor monument preservation efforts in Thessaloniki and Athens that have been targeting mainly SO<sub>2</sub> as an atmospheric acidity source. Our results here give also some indication that previous calculations on the relative importance of global automotive emissions on the global COS budget might be revised after measurements have been made for the European fleet.