2.024 Hydroperoxide measurements in the marine boundary layer around the Arabian Peninsula during the AQABA ship-campaign.

Early Career Scientist

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Abstract:

The general goal of the AQABA (Air Quality and climate change in the Arabian BAsin) campaign was to study the influence of air pollution on public health, climate and the natural environment. During the two-month expedition, AQABA encountered a unique variety of air masses, ranging from pristine conditions over the Arabian Sea and unpolluted but dusty air originating from Africa over the Red Sea, over moderately polluted conditions over the Mediterranean downwind from urban areas and the Middle East, to ship exhaust and petrochemical emissions in the Persian Gulf area.
For this purpose the hydroperoxides are of major interest. During the first leg the mixing ratios of the hydroperoxides decreased from the Red Sea (median H_2O_2 169 ppt, ROOH 182 ppt) southeastwards to the Gulf of Aden and the Arabian Sea (H_2O_2 111 ppt, ROOH 88 ppt). At the end of the leg in the Gulf of Oman and the Persian Gulf, the mixing ratios increased to 143 ppt for H_2O_2 (maximum 603 ppt) and 170 ppt for ROOH (maximum 1,995 ppt).
During the second leg the mixing ratios were slightly higher. In the Persian Gulf mixing ratios of 234 ppt for H_2O_2 and 182 ppt for ROOH were found. The lowest mixing ratios were observed over the Arabian Sea and the Gulf of Aden (H_2O_2 157 ppt, ROOH 67 ppt). In the Red Sea and the Mediterranean concentrations increased to 269 ppt for H_2O_2 and 224 ppt for ROOH.
Over the Mediterranean, the Red Sea and the Gulf of Aden we observed a diurnal variation with maxima between 12 a.m. and 3 p.m.. Over the Arabian Sea and the Persian Gulf no significant diurnal variation was found. The H_2O_2/ROOH ratio varied from 0.03 (minimum, Persian Gulf) to 11.4 (maximum, Arabian Sea).
Further interpretation will be presented on the poster.