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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Seasonal variation of aliphatic amines in marine sub-micrometer particles at the Cape Verde islands" *by* C. Müller et al.

Anonymous Referee #2

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As stated in this manuscript, marine aerosols are playing an important role in the Earth system, especially in the climate and atmospheric chemistry, influencing both direct and indirect forcing. Until recently, sea-salt formation from bubble bursting and DMS oxidation were thought to be the most sources of marine aerosols. However, there is growing evidence that organic compounds may play an important role. This contribution focuses on the analysis of samples from the Cape Verde Atmospheric Observatory and confirms the presence of complex organic compounds (such as aliphatic amines) in marine aerosols, as previously highlighted for Mace Head.

This is an original contribution which merit publication in ACP.

While there is no doubt about the presence of these amines (or their salts) in the collected samples, their origin is unclear. The hypothesized process of formation seems to be linked to uptake from the gas phase or gas to particle conversion. I would encourage the authors to clarify this (even is the process is unknown) and discuss in more detail the different possible sources.

Some backward trajectory analyses are made leading to figure 3, leading to two distinct sectors (certainly marked by the red line in this figure). However, are all trajectories from Africa linked to the presence of amine salts? Can you combine both the backward trajectories with the Modis-Aqua images? Or in other words, are those trajectories staying longer above biologically active oceanic region showing larger amine content? Can the amines by entrained by bubble bursting in these regions?

There is also some discussion about the difference between these observations and those made at Mace Head by Facchini et al (approximately a factor ten higher in the later study), which is explained by possible different local productivity. But why local? Aliphatic amines are certainly reactive in wet marine aerosols and maybe degraded during transport from the Western African coast (where the biological activity seems to be the strongest if I correctly understood figure 9). Such observation could be a hint about the importance of particle ageing on their amine content.

Can you obtain some information from your samples about the acidity of the aerosols (or its ionic strength)? In fact, the uptake or gas to particle conversion of these compounds may be driven by acidity. . .

The paper is well written but maybe carries too many figures.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 14825, 2009.