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Atmospheric
Chemistry
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Discussions

Interactive comment on "Changes in background aerosol composition in Finland during polluted and clean periods studied by TEM/EDX individual particle analysis" *by* J. V. Niemi et al.

Anonymous Referee #1

Received and published: 3 September 2006

Review of manuscript JPCD-6-6753 by Niemi et al.

General comments:

This paper examines the composition, morphology and mixing state of particles with TEM/EDX at a rural background site in Finland during polluted, intermediate, and clean periods with different origins of particles. Particle types were described and their abundances, composition, mixing state and sources were discussed. The paper, in most places, is easy to follow. The data and discussion add nicely to the growing body of information on the properties of atmospheric particles. I recommend the paper be published after the following questions are addressed adequately.

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Specific comments:

I agree with referee # 3 that the current classifications of the different particle types is confusing, and I strongly suggest that the classifications be modified to make things clearer and easier to understand and follow. Related, can the authors really make a distinction between ammonium sulfate and other possible sulfates such as letovicite or ammonium bisulfate from the TEM/EDX? On page 6765, line 5-10, the authors argue that the sulfur was probably present as ammonium sulphate because the particles did not have a satellite droplet ring around them, which is characteristic of such acid sulfates. Does letovicite have a ring when evaporated?

Abstract, line 15: “samples contained elevated proportions of silicates (22-33%, also fly ash particles).” This is a little confusing. Is the fly ash lumped in with silicates? This sentence should be modified to make it clearer what the authors are suggesting.

Page 6759, line 14. Should PM1 be replaced with PM1.6?

Page 6769, line 1: “as fractional recrystallization of sea salt particles or marine organisms.” I do not understand the fractional recrystallization of sea salt particles. If it is a sea salt particle it should contain Na and be grouped with the Sea-Salt particles? Are the authors suggesting that a sea-salt particle can break into a Na-component and Ca-component when it crystallizes? Is there any evidence in the literature for this? Please explain and expand.

Page 6774: line 3: “silicates and metal hydroxides/oxides with spherical morphology (fly ash),” Are the authors indicating that some of the silicates have spherical (fly ash) morphology and some of the metal hydroxides/oxides have spherical (fly ash) morphology? Please modify this sentence to make this point more clear.

Table 3: for the metal oxides/hydroxides, the morphology is irregular angular or circular particles. Should this be “circular fly ash particles” to make this description more consistent with the rest of the document? What subgroup does flyash belong?

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 6753, 2006.

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