

Interactive comment on “Distribution of lead in single atmospheric particles” by D. M. Murphy et al.

Anonymous Referee #2

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This paper presents some fascinating and important data on airborne particulate lead. The authors have done a great job in organizing, presenting and interpreting the data. I also appreciate the inclusion of Section 4.2 that carefully examines potential sources of contamination. I recommend this paper be published in ACP.

I have only a few very minor comments for clarity in the final manuscript.

1. p. 3778: Calibration. This section explains well the difficulty in making the observations quantitative, that is, in converting data into absolute mass concentrations of airborne lead. My impression is that this important point is not made clearly earlier in the manuscript, but should be. For example, in the Abstract it is stated “Less common particles with high Pb contents contributed a majority of the total amount of Pb.” This

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implies the total mass concentration, as well as the mass concentration in high-Pb particles, is quantified. I suggest to add a few statements early in the paper regarding this point so it is clear what the limitations of the data are.

2. p. 3768, IMPROVE data: it must be stated that all IMPROVE data are for lead in the FINE aerosol (PM_{2.5}) fraction only. It is unknown how much lead is in PM₁₀ because that sample is not routinely speciated. Also, a quick check of the data from San Gorgonio, a site often impacted by the LA Basin which is flagged as having high emissions, shows that the 1999-2004 average mass concentration was 1.3 ng m⁻³, quite a bit higher than observed for Pt. Reyes on the coast. It might be interesting to include this site in the figure.

3. Figure 6: The figure caption should make clear this is PALMS data only.

4. P. 3765, ll 12: a reference for the statement re Doe Run should be provided.

5. p. 3766, ll 9: The aerodynamic diameter is of relevance for health impacts, since respirable particles are defined in terms of aerodynamic diameter.

6. Figure 14: the x-axis is a little confusing, because usually the number mean diameter of the accumulation mode would be indicated, and mode diameters larger than about 300 nm are not realistic. Maybe it could be something like “geometric diameter of scavenging particle”?

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 3763, 2007.

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