

Generating aerosol particles via dry dispersion is a non-trivial task in aerosol research, though a number of techniques have been proposed and used. Roesch et al. have described and developed a simple 3D printed fluidized bed generator, and evaluated its performance by dispersing Arizona Test Dust. This instrument can be very useful in mineral dust aerosol research. I would recommend it for final publication after the following comments are properly addressed.

Major comments:

The generator can generate aerosol with total concentrations up to $\sim 150 \text{ cm}^{-3}$ if 0.5 g ATD sample is added into the generator. For aerosol research, monodisperse particles are typically required. Therefore, if the aerosol flow exiting the generator is passed through a DMA to produce monodisperse aerosol, the resulted aerosol concentration might be very low. This may largely limit the applicability of this generator.

Minor comments:

Page 1, line 20-23: In addition to Garimella et al. (2014), there are a number of studies showing that wet generation could change the physicochemical properties of mineral dust particles, including Sullivan et al. (2010) and Kumar et al. (2011). This issue has also been discussed by a recent review paper (Tang et al., 2016).

Page 2, line 11-14: I do not agree with the statement “These techniques require multiple instruments and supervision of the generation setup”. As pointed out in the same paragraph, those generators are actually very simple and only require a flask and a shaker. I believe the major drawback is that particle number concentration typically shows fast and large variation (e.g., Tang et al., 2015).

Figures 4-5: Could authors briefly explain in figure captions what each stages are actually doing? This will help readers better understand these two figures.

Technical comments:

I suggest authors should carefully check the entire manuscript as there are quite a lot of places where typos and grammatical issues occur. Below I only provide a few examples:

Page 1, line 8: should it be “due to either rarity or expense”?

Page 1, line 20: change “require they first be made...” to “require them first to be made...”?

Page 1, line 26: change “needed **or** for...” to “needed for...”?

Page 2, line 25: delete “But” or change it to “However”?

Page 3, line 17: the last sentence in this paragraph is grammatically incorrect.

Page 5, line 8: The first sentence is awkward. We do not perform time-series. What we can perform is measurement.

Page 5, line 24: change “as function” to “as a function”.

Page 6, line 6: should the more professional terminology be “cloud condensation nucleation and ice nucleation potential”?

References:

Kumar, P., Sokolik, I. N., and Nenes, A.: Cloud condensation nuclei activity and droplet activation kinetics of wet processed regional dust samples and minerals, *Atmos. Chem. Phys.*, 11, 8661-8676, 2011.

Sullivan, R. C., Moore, M. J. K., Petters, M. D., Kreidenweis, S. M., Qafoku, O., Laskin, A., Roberts, G. C., and Prather, K. A.: Impact of Particle Generation Method on the Apparent Hygroscopicity of Insoluble Mineral Particles, *Aerosol Sci. Technol.*, 44, 830-846, 2010.

Tang, M. J., Whitehead, J., Davidson, N. M., Pope, F. D., Alfarra, M. R., McFiggans, G., and Kalberer, M.: Cloud Condensation Nucleation Activities of Calcium Carbonate and its Atmospheric Ageing Products, *Phys. Chem. Chem. Phys.*, 17, 32194-32203, 2015.

Tang, M. J., Cziczo, D. J., and Grassian, V. H.: Interactions of Water with Mineral Dust Aerosol: Water Adsorption, Hygroscopicity, Cloud Condensation and Ice Nucleation, *Chem. Rev.*, 116, 4205–4259, 2016.