

Author's Accepted Manuscript

AFM imaging of exhaled microdroplets and dry residues collected by impactor

Andrey Y. Mikheev, Victor N. Morozov



PII: S0021-8502(18)30055-7
DOI: <https://doi.org/10.1016/j.jaerosci.2018.06.012>
Reference: AS5308

To appear in: *Journal of Aerosol Science*

Received date: 13 February 2018
Revised date: 25 May 2018
Accepted date: 25 June 2018

Cite this article as: Andrey Y. Mikheev and Victor N. Morozov, AFM imaging of exhaled microdroplets and dry residues collected by impactor, *Journal of Aerosol Science*, <https://doi.org/10.1016/j.jaerosci.2018.06.012>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

AFM imaging of exhaled microdroplets and dry residues collected by impactor

Andrey Y. Mikheev¹, Victor N. Morozov^{1,2*}

¹*Institute of Theoretical and Experimental Biophysics, Russian Academy of Sciences, 3 Institutskaya St., Moscow Region, Pushchino, Russian Federation.*

²*National Center for Biodefense and Infectious Diseases, George Mason University, Manassas, VA 20110.*

**Corresponding author. Tel.: 7-496-773-0623; fax: 7-496-733-0553. vmorozov@gmu.edu*

Abstract

Here we describe how individual sub-micron exhaled droplets and dry residue particles (DRPs) could be quickly collected on mica, glass, highly oriented pyrolytic graphite, and carboxymethyl cellulose film using a simple impactor. Most collected DRPs had size between 200 nm and 1000 nm and were readily seen under a low power optical microscope with dark-field illumination. The size and shape of the collected DRPs were analyzed with atomic force microscopy (AFM). It was found that the collection efficiency and the shape of the collected DRP depend on a number of factors, including (i) temperature and humidity of exhaled air, (ii) substrate temperature, and (iii) substrate hydrophobicity. Exposure of collected DRPs to humid air or to high temperature resulted in their spreading over the substrate surface, revealing the presence of lipid monolayers and solid nanoparticles inside the DRPs.

Graphical Abstract



Download English Version:

<https://daneshyari.com/en/article/8865223>

Download Persian Version:

<https://daneshyari.com/article/8865223>

[Daneshyari.com](https://daneshyari.com)