| Field Name | Field Definition |
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| XRD | X-ray Diffraction |
| Aerodynamic diameter | Size of an equivalent sphere with density of 1 g/cm$^3$ which settles in still air at the same velocity as the particle expressed in µm. For the impactors used in this study, the $d_{50}$ for each stage was considered as the representative aerodynamic diameter unless specified otherwise |
| Data Source | Lists the source from which data was obtained i.e., either instruments used in this study or literature |
| XRD signal | XRD intensity measured in counts normalized by the aerosol mass measured in µg collected on silver filters |
| Relative XRD signal | Mass normalized XRD intensity expressed as a % of the maximum from a specific data source |
| MOUDI | Micro-Orifice Uniform Deposition Impactor |
| QCM | Quartz crystal micro-balance MOUDI impactor |
| Edmunds et al. (1977) | Edmonds, J. W.; Henslee, W. W.; Guerra, R. E. Particle Size Effects in the Determination of Respirable α-Quartz by x-Ray Diffraction. Anal. Chem. 1977, 49 (14), 2196–2203. https://doi.org/10.1021/ac50022a022 |
| Gordon and Harris (1955) | Gordon, R. L.; Harris, G. W. Effect of Particle-Size on the Quantitative Determination of Quartz by X-Ray Diffraction. Nature 1955, 175 (4469), 1135–1135. https://doi.org/10.1038/1751135a0 |
| Bhaskar et al. (1994) | Bhaskar, R.; Li, J.; Xu, L. A Comparative Study of Particle Size Dependency of IR and XRD Methods for Quartz Analysis. Am. Ind. Hyg. Assoc. J. 1994, 55 (7), 605–609. https://doi.org/10.1080/15428119491018682 |

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| Yabuta and Ohta (2003) | Yabuta, J.; Ohta, H. Determination of Free Silica in Dust Particles: Effect of Particle Size for the X-Ray Diffraction and Phosphoric Acid Methods. Ind. Health 2003, 41 (3), 249–259. https://doi.org/10.2486/indhealth.41.249 |
| FT-IR | Fourier transform Infrared Spectroscopy |
| FT-IR signal | FT-IR absorbance measured in arbitrary units normalized by the aerosol mass measured in µg collected on PVC filters |
| FT-IR signal error | One standard deviation in FT-IR signal from different filter collections expressed in arb. units / µg |
| Relative FT-IR signal | Mass normalized FT-IR intensity expressed as a % of the maximum from a specific data source |
| arb. units | arbitrary units |
| AAC | Aerodynamic Aerosol Classifier |
| Dodgson & Whittaker (1973) | Dodgson, J.; Whittaker, W. The Determination of Quartz in Respirable Dust Samples by Infrared Spectrophotometry-I: The Potassium Bromide Disc Method. Ann. Occup. Hyg. 1973, 16 (4), 373–387. https://doi.org/10.1093/annhyg/16.4.373 |
| Foster & Walker (1984) | Foster, R. D.; Walker, R. F. Quantitative Determination of Crystalline Silica in Respirable-Size Dust Samples by Infrared Spectrophotometry. Analyst 1984, 109 (9), 1117. https://doi.org/10.1039/an9840901117 |
| Kauffer (2002) | Kauffer, E.; Moulut, J. C.; Masson, A.; Protois, J. C.; Grzebyk, M. Comparison by X-Ray Diffraction and Infrared Spectroscopy of Two Samples of α Quartz with the NIST SRM 1878a α |

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| | Quartz. Ann. Occup. Hyg. 2002, 46 (4), 409–421. https://doi.org/10.1093/annhyg/mef050 |
| Stacey et al. (2009) | Stacey, P.; Kauffer, E.; Moulut, J. C.; Dion, C.; Beauparlant, M.; Fernandez, P.; Key-Schwartz, R.; Friede, B.; Wake, D. An International Comparison of the Crystallinity of Calibration Materials for the Analysis of Respirable α-Quartz Using X-Ray Diffraction and a Comparison with Results from the Infrared KBr Disc Method. Ann. Occup. Hyg. 2009, 53 (6), 639–649. https://doi.org/10.1093/annhyg/mep038 |
| Tuddenham & Lyon (1960) | Tuddenham, W. M.; Lyon, R. J. P. Infrared Techniques in the Identification and Measurement of Minerals. Anal. Chem. 1960, 32 (12), 1630–1634. https://doi.org/10.1021/ac60168a026 |
| Method | XRD or FT-IR analysis |
| Quartz content | Fractional quartz content in the sampled aerosol expressed as a % |
| Quartz content error | One standard deviation in quartz content expressed as a % from multiple measurements |
| Cristobalite content | Fractional cristobalite content in the sampled aerosol expressed as a % |
| Cristobalite content error | One standard deviation in cristobalite content expressed as a % from multiple measurements |
| Wavenumber | Number of wavelengths per unit distance expressed in $cm^{-1}$ |
| Avg OPTIR Signal Stage9 | O-PTIR signal measured in mV (milli Volts) from aerosol sampled on silver filter averaged over multiple spectra. Aerosol aerodynamic diameter corresponds to stage 9 of the MOUDI, i.e., $d_{50} = 0.1$ μm |

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| Avg OPTIR Signal Stage4 | O-PTIR signal measured in mV from aerosol sampled on silver filter averaged over multiple spectra. Aerosol aerodynamic diameter corresponds to stage 4 of the MOUDI, i.e., $d_{50}$ = 1.8 μm |
| Distribution type | Type of size distribution based on mass ($dM/dLogd_p$) or surface area ($dS/dLogd_p$) |
| Cumulative UL | Upper limit of cumulative distribution obtained by multiplying $dM/dLogd_p$ by the total crystalline silica content from size-fractionated XRD calibration, the ACGIH respirable fraction, and the ICRP respiratory deposition fraction expressed as a %<br><br>$dM/dLogd_p$ normalized by the density and multiplied by the surface area to volume ratio of each particle with diameter $d_{50}$ to compute $dS/dLogd_p$ and also used to determine the upper limit cumulative distribution as described above. |
| Cumulative LL | Lower limit of cumulative distribution obtained by multiplying $dM/dLogd_p$ by the total crystalline silica content from conventional XRD calibration, the ACGIH respirable fraction, and the ICRP respiratory deposition fraction expressed as a %<br><br>$dM/dLogd_p$ normalized by the density and multiplied by the surface area to volume ratio of each particle with diameter $d_{50}$ to compute $dS/dLogd_p$ and also used to determine the lower limit cumulative distribution as described above. |

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| 2θ | Diffraction angle from XRD measurements expressed in ° |
| XRD Intensity | Raw intensity obtained from sanded engineered stone on silver filter measured in counts |
| Raman Shift | Frequency shift between the incident and Raman scattered light expressed in $cm^{-1}$ |
| Raman Intensity Cristobalite | Raw intensity obtained from sanded engineered stone on silver filter (region 1) measured in counts |
| Raman Intensity Quartz | Raw intensity obtained from sanded engineered stone on silver filter (region 2) measured in counts |
| Material | Refers to engineered stone aerosol from grinding, or reference powders, Min-U-Sil 5 (quartz) and SRM1879b (cristobalite) |
| dM/dLogdp | Mass-based size distribution expressed in $mg/m^3$ from APS or MOUDI |
| Error dM/dLogdp | One standard deviation in dM/dLogdp over multiple measurements expressed in $mg/m^3$ |
| APS | Aerodynamic Particle Sizer |
| XRD signal error | One standard deviation in XRD signal from different filter collections expressed in counts / µg |
| Calibration type | Size-fractionated (XRD/FT-IR intensity normalized by the mass for reference material size-fractionated using MOUDI) or conventional (XRD/FT-IR intensity normalized by the mass for reference material used as is) |
| TCS XRD | Total crystalline silica i.e., sum of quartz and cristobalite contents from XRD calibrations expressed as % |

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| TCS FT-IR | Total crystalline silica i.e., sum of quartz and cristobalite contents from FT-IR calibrations expressed as % |
| Error TCS FT-IR | Uncertainty in total crystalline silica content expressed as a % from FT-IR calibrations |
| IR Absorbance Stage X | IR absorbance measured in arbitrary units for aerosol sampled on different MOUDI stages 1 through 10 |
| EELS intensity Q | EELS intensity measured in counts from quartz reference powder |
| EELS intensity C | EELS intensity measured in counts from cristobalite reference powder |
| EELS intensity FS | EELS intensity measured in counts from fumed silica reference powder |
| EELS intensity NC | EELS intensity measured in counts for a respirable particle sampled on Stage 4 of the MOUDI near the particle's center |
| EELS intensity E | EELS intensity measured in counts for a respirable particle sampled on Stage 4 of the MOUDI at the particle's edge |
| EELS intensity OE | EELS intensity measured in counts for a respirable particle sampled on Stage 4 of the MOUDI at the particle's outer edge |