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Silica is one of the world's most significant causes of occupational disease. Although it was publicly acknowledged by the Secretary of Labor (Frances Perkins) in 1938, regulations and safety measures were lacking for many years. Luckily this year, OSHA responded with a significant update to the previous regulations. Although enforcement will still be key the agency has taken a big step regarding their priorities to protecting workers and their families.



With the new standard driving silica to the forefront of occupational health and hygiene, SAI received an overwhelming number of questions from the AIHce. We have chosen a few of the questions to share with you regarding: the new regulations, laboratory analytical questions, and equipment related questions.

Stay tuned for an additional email concerning silica and toxicology.

AIHce Silica FAQs

Silica Regulation Questions:

1. Where is the silica calculator link and what it will mean with the update?

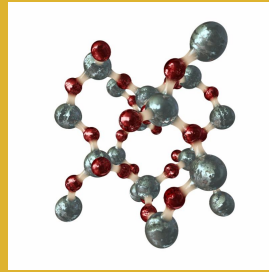
The calculator will not be a necessity at the outset. The PEL is 50ug/m³ across the board. We believe that OSHA will eventually update the calculator to reflect the new standard. At the request of the client SAI can provide the PEL on any report we send.

2. How are the levels going to work with the new standard since it will be combining all 3 phases of silica?

The analysis will still be performed by the same method. The difference will be that instead of results being reported separately the mass of the different phases of silica would be summed and the concentrations calculated using the total mass (only reporting total silica concentrations). At the request, all 3 phases can be reported individually (alpha quartz, cristobalite, and tridymite) and a total silica concentration.

3. What is the minimum sample time needed if an IH is drawing air at 1.7 LPM to detect below the AL?

At 1.7 LPM an IH would need to pull air for 470 minutes to get an LOD of 10 ug. Pulling any less than that would require the laboratory to go to the 5 ug LOD.



Laboratory Related Questions:

1. What method do you use for silica? What will change within the method under the new standards?

We currently use the NIOSH 7500/OSHA ID142 methods. The only change in the methods will be the detection limits.

2. Do we need to use a pre-weighed filter?

Pre-weighed filters are only required when the client is requesting NIOSH 0600 analysis also. When requesting NIOSH 0600 it is strongly suggested that SAI's cassettes are used. This will provide more accurate results since they are weighed on the same balance, in the same environmental conditions.

3. Is there a gravimetric analysis of the filter?

If requested by the client, (see above).

4. What will results look like and how do we interpret them?

Our new report will have a simplified and easy to read

format with a data table containing: Lab Sample ID, Description, Air Volume (m³), Analyte, Analyte LOD (mg), Analyte Mass (mg) and Concentration (mg/m³). Stay tuned, we will post a sample report for your viewing pleasure very soon.

5. Do we need to provide a bulk sample of the settled dust?

Although not required by the method if potential interferences are present it is suggested that bulk samples be submitted. These help us to eliminate possible interferences.

6. Do we need to provide field and media blanks?

Field and media blanks are a good idea to allow for blank corrections.

7. Are there any mathematical calculations which we will need to perform?

As of right now we do not provide TWA's for individuals. If requested, SAI can include this on your report.

8. What is tripoli and how is it related to my silica sampling?

Tripoli is the commercial name for a particular rock which is a quartzite based material primarily composed of silica - will register as one of the 3 phases.

Equipment Related Questions:

1. Does the new standard specify a flow rate for personal air sampling for crystalline silica?

No. Appendix A of the standard specifies a maximum

limit of detection of $\frac{1}{4}$ of the PEL, or $12.5 \mu\text{g}/\text{M}^3$, since the new PEL is set at $50 \mu\text{g}/\text{M}^3$. It also specifies six traditional cyclone sampling methods, and states that they can be enhanced to improve the limit of detection. That would include the use of higher flow cyclones, and NIOSH tested several types in anticipation of the new standard. The set flow rate should match the flow rate listed for the chosen cyclone for following the ACGIH size separation curve with a 50% cut at 4 microns. That flow rate will be listed with the supplier instruction that accompanies the cyclone.

2. Can I use any personal monitoring pump that meets the flow rate requirement of the cyclone?

It should also be a constant flow control pump, so that the flow rate will be held accurately within 5% of the set flow. That will keep the cyclone within its flow specification as the dust load on the filter increases.

An additional note: In dust sampling the sample load is quite significant in the total back pressure that the pump must work against. The initial back pressure of the system is quite low, because the filter membrane used (5 micron PVC) has a very large pore size compared to other sampling methods. As dust collects on the filter, this back pressure climbs quickly, and in heavy dust conditions it can be quite large. (Dust sampling is the reason that constant flow control pumps were invented). For this reason, I recommend the Gilian 10i pump (4 to 10 LPM) for the 4.2 LPM cyclone, because the 5 LPM pumps are too close to their upper performance envelope to collect much dust. Those pumps would be much more apt to fault out early in heavy dust conditions than the 10 LPM pump.



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