

Aerosol sampling in workplaces: losses of material in silver filter transportation

Campionamento di aerosol negli ambienti di lavoro: le perdite di materiale durante le operazioni di trasporto delle membrane filtranti

Claudio Kunkar, Emma Incocciati*, Marco Mecchia, Giuseppe Gargaro

Consulenza Tecnica Accertamento Rischi e Prevenzione, INAIL - Direzione Generale, Roma

*Corresponding author:

Emma Incocciati, Via Roberto Ferruzzi, 40, 00143 Roma, Italy; tel. ++ 39 06 54872545; fax ++ 39 06 54872365; e.mail: e.incocciati@inail.it

Occupational exposure to aerosols is evaluated through sampling of particulate matter on filters, which are sent to a laboratory for the analysis. The transportation step from sampling place to the laboratory can cause losses of material, leading to an underestimation of aerosol weight and related concentration. This experimental study evaluated losses of material sampled on filters after transportation by postal service according to ISO 15767:2009, by means of two different filter holders (SKC and Aquaria) and verified the possibility to minimize losses applying a solution of collodion on the filter, after sampling and before postal sending.

Experimental tests have proved that:

- weigh loss of filters appears to be correlated with the filter holder in use. In fact, collected data prove that one type (SKC) performs excellently while the other (Aquaria) shows material losses as high as 10% in weight. However, it has to be remarked that while Aquaria cassettes had been used for about 10 years, the SKC ones were brand new;
- the choose of a suitable filter holder can solve the problem of weigh loss even without the need of a stabilizing treatment with collodion.

With regard to the effectiveness of the filters treatment with collodion no measurable weigh losses were found employing it, regardless of the mass of particulate on them (up to 6,5 mg) and of filter holder in use.