# *Letter to the editor*

Scand J Work Environ Health 1985;11(6):498

**Author`s reply**

by Sango C, Nielsen J, Skerfving S, Skarping G

**Affiliation:** Department of Technical Analytical Chemistry, Lund Institute of Technology, Chemical Centre, POB 124, S-221 00 Lund, Sweden.

**Key terms:** letter to the editor; letter to the editor

## Author's reply

Dr Brochhagen has made a few minor comments on our study. The main message of our paper was that exposure to polyisocyanates is not harmless. Our case study of polyisocyanate spray-painting has shown that high inhalation exposure may occur which may induce serious symptoms and signs in workers.

Of course we are fully aware of the fact that, during inhalation exposure, polyisocyanates occur mainly as aerosols, not as vapors. In fact, this phenomenon was stressed in our paper. However, the Swedish level limit value is based upon parts per million [AFS 1984; 5 (4)] and thus is not fully adequate, which we noted.

In addition polyisocyanates are usually not well defined chemical entities. Thus we have to find an adequate way of expressing concentrations of polyisocyanate aerosol in air. Dr Brochhagen proposes that the level be given as the corresponding level of the basic diisocyanate. We think that this is an inexpedient way.

Instead, as we say in our paper, the level should be expressed as the concentration of isocyanate groups (NCO), as micromoles per cubic meter, which is better defined chemically. Moreover, this use takes care of both present common polyisocyanates and possible future problems with polyisocyanates containing two or more different isocyanates. Moreover, the biological effects, both of diisocyanates and of polyisocyanates, are probably associated with NCO. In fact, in the United Kingdom, a limit value expressed as $\mu g$ $NCO/m^3$ has already been established (3).

We have no reason to believe that we systematically underestimated the levels of diisocyanate and polyisocyanate in the way indicated by Dr Brochhagen. The sampling procedure we employed is the one in common use. It is correct that Rosenberg & Tuomi (2), whom Dr Brochhagen quotes as support for his assumption, had a low recovery, though only of diisocyanate, not of polyisocyanate. However, their data are few. Furthermore, they did not study the polyisocyanate we dealt with. The same applies to the second study quoted (1).

Finally, many of the analytical and medical problems encountered in connection with polyisocyanate exposure would be solved considerably faster if the producers supplied detailed information as regards the composition, chemical properties, suitable chromatographic procedures, and biomedical documentation on the products they offer and gave access to reference substances.

*References*


1. Dharmarajan V. Occupational exposures to methylene bisphenylisocyanate (MDI): Gaseous or aerosol? J Environ Pathol Toxicol 2 (1979) 1—8.
2. Rosenberg C, Tuomi J. Airborne isocyanates in polyurethane spray painting: Determination and respiratory efficiency. Am Ind Hyg Assoc J 45 (1984) 117—121.
3. Silk SJ, Hardy HL. Control limits for isocyanates. Ann Occup Hyg 27 (1983) 333—339.
4. Swedish National Board of Occupational Safety and Health. Limit values. Stockholm 1984. (AFS 1984: 5).



Carsten Sangö, PhD,[1] Jörn Nielsen, MD,[2] Staffan Skerfving, MD,[2] Gunnar Skarping[2]

[1] Department of Technical Analytical Chemistry, Lund Institute of Technology, Chemical Centre, POB 124, S-221 00 Lund, Sweden.

[2] Department of Occupational Medicine, University Hospital, S-221 85 Lund, Sweden.