Benzene Occupational Exposure Limit Proposed on basis of a Comprehensive Review of Worker Studies

Scientists have completed a review of about 100 health studies on benzene, focussing on the key effects on white blood cells and on genetic damage. Using objective screening and scoring procedures the studies were ranked by study quality. The top-quality studies were then reviewed and the exposure levels identified at which health effects occurred or did not occur. Additionally, studies were characterised by the strength of the evidence as to whether the findings were "more certain" or "less certain". The context of benzene exposure was also taken into account with findings from more specific factory type exposures to benzene seen as being stronger evidence than those from mixed exposure to fuel and traffic emissions in service stations or to polluted urban air as in the case of traffic policemen.

Analysing the high-quality studies and more certain evidence showed that blood effects (haematotoxicity) and genetic effects (chromosomal aberrations and micronucleus formation) were seen at and above 2 ppm (per 8 hours) exposure. A credible no effect exposure for these effects is 0.5 ppm (per 8 hours) based both on projection from the levels causing effects and on the confirmed no effect levels identified. This supports an Occupational Exposure Limit of 0.5 ppm / 8h.

Although review of the relevant studies indicates that 0.5 ppm / 8h is a safe exposure level for benzene in the workplace, ECHA have a concern that bone marrow may be more sensitive to genetic damage than lymphocyte blood cells. There is no clear evidence about this point at present so Cefic and industry partners have started some research to address the question. **Pending clarification of this question it is considered appropriate to apply a further two-fold reduction in exposure to give an Occupational Exposure Limit of 0.25 ppm / 8h.**

The full review of these data is in preparation for publication in a peer-reviewed toxicology scientific journal.