Comparative study on occupational exposure limits of chemical substances in workplace between GBZ 2.1 in China and ACGIH in USA

W.J.Li¹, M.Zhang¹, D.Wang¹

¹Occupational standards research department, National Institute of Occupational Health and Poison Control, Chinese Center for Disease Control and Prevention, Beijing, P. R. China

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Objectives:
To systematically compare OELs between on quantity, level, procedures of management etc.; to provide basic scientific evidence for the planning and development of OH standards in China.

Methods:
Compilation of a database on OELs in GBZ2.1 and in TLV-CS according to types of exposure limits, and comparison of the data in the two systems on the values of exposure limits, quantities, legal status, TLV-CS setting up principles, basis, condition and procedures, key adverse effect, application of carcinogenicity/sensitization/skin notations, adjustment of OELs for unusual work schedules, the concept and application of combined effects and Excursion Limits, the identity of particles, and analysis of the comparison result.

Results:
There are 339 CS in GBZ2.1 and 656 in TLV-CS. The number of the CS in GBZ2.1 with OELs but not included in TLV-CS is 52; the CS with OELs in TLV-CS but not in GBZ2.1 are 371. There are 260 CS which have OELs both in GBZ2.1 and ACGIH and with a total of 302 OELs, among them, 47 OELs are higher and 96 are lower in the GBZ2.1 than the ones in TLV-CS, 81 of them are similar, and 77 are the same in the two. Guidelines on notations of carcinogenicity, sensitization and skin need to be developed.

Conclusions:
1. Evaluation guidelines on risk assessment of carcinogenicity, sensitization and skin need to be formulated in China. 2. Priority needs to be given to review and revision of the OELs which are significantly different from the ones in TLV-CSas well as CS which have no OELs in GBZ2.1 but have OELs in TLV-CS. 3. Periodic and systematic review and revision of the existing OELs should be conducted. 4. The concept of Excursion Limits, adjustment of OELs for unusual work schedules need to be elaborated and examined, etc..