

MULTISPHERE CARCINOGENIC RISK ESTIMATION

Leonid Plotnitskiy

Odessa State Environmental University, Odessa, Ukraine

Last years under aegis of such international organizations as the World Health Organization, the United Nations Environmental Program, the International Labor Organization, so-called risk estimation receives increasingly wide distribution indifferent countries of the world. It is understood as estimation of probability of adverse influence of the harmful substances polluting an inhabitancy or the industrial environment on human health.

Such risk estimation is applicable for any environment, more exact to any source of receipt of polluting substances into human organism. However, the greatest values have results of so-called multisphere risk estimation, i.e., risk for population health of the receipt of polluting substances from several or from all possible sources.

One of the basic difficulties of carrying out of multisphere risk estimation consists in gathering the necessary data coordinated about pollution of various environments. Frequently it is very difficult to obtain authentic data about pollution of all environments with which the person contacts with certain specific substances.

In the given work we had lead multisphere cancerogenic risk estimation for health of the population of the Odessa region from influence of the polluting substances coming in organism from atmospheric air, with potable water and from ground.

For carrying out of such estimation the data about concentration of various components of the emissions formed at manufacturing of smoked food stuffs in the traditional way, the information on process of water chlorination by water-preparation and background concentration of benz(a)pyrene in soils of various settlements of Ukraine were used. On these data various scenarios of influence of polluting substances have been marked for inhabitants of prospective area.

In view of values of concentration of various polyaromatic hydrocarbonic compounds in emissions of smoking chambers, and also in view of technical and technological parameters of emission, the field of concentrations has been calculated. It allowed to define value of risk (monosphere - atmospheric) on various distances from a source of emission (from 50 m up to 250 m). Thus, 5 groups of the population, and accordingly 5 scenarios of influence have been marked. The group of workers of the enterprise making smoked products for which the individual scenario of influence has been determined has been separately marked. Results of calculation have shown, that values of the total risk connected with air pollution by emissions of the smoking chamber, have the order 10^{-4} . For workers of the enterprise risk level is 5-6 times below, than for the population, living in zone of influence of a source of emission. It means that the level of air pollution which is formed under action of the given concentration cancerogenic compounds, is very high, and the corresponding this level of risk for health - unacceptable.

Technological data about of water chlorination process have allowed to define concentration of chloroform and four-chloride carbon in potable water and, accordingly, to estimate a level of the cancerogenic risk caused by these concentrations. Such estimation has shown, that the total cancerogenic risk for health at consumption of the potable water polluted by examined chlorine-containing connections exceeds a acceptable level on three orders that testifies to the highest health hazard of the population.

For an estimation of probability of adverse influence on human health values of background concentrations of benz(a)pyrene in soil have been also used. Depending on this parameter 3 types of districts and scenarios corresponding them have been marked: large city, small city and countryside. For each of these types the risk for health has been calculated. Its maximal value (for large city) has amounted $4,35 \cdot 10^{-7}$, that more than in 2 times below a acceptable level.

At an estimation многосредового risk it has been revealed, that under the given conditions the level of soil pollution practically does not influence total risk for health of the population. Distinctions between values of risk at different scripts of influence small, that is caused by the smaller contribution of atmosphere pollution to the total risk in comparison with pollution of potable water.

Such results mean that frequently inhabitancy can be much harmful for human health, than the industrial environment. Distinctive feature of a technique of risk estimation consists in that it allows to allocate from the set of sources of pollution influencing the person in complex the most dangerous one.