

**Tretyakova O. V. Chemical safety of polymeric materials for transport purposes application as a toxicological and hygienic problem.** - Qualifying scientific work on the rights of manuscripts. The dissertation for obtaining the scientific degree of the doctor of biological sciences in the specialty 14.02.01 - hygiene and professional pathology.

The thesis is devoted to the complex research of polymeric materials of transport purposes, the developing of new scientific approaches to their hygienic regulation taking into account physical, chemical, toxicological, hygienic, technological and operational features, mechanisms of combined action of volatile components, in regular operating conditions, as well as in the emergent situations. On this basis was proposed and implemented in the practice the complex of preventive and corrective measures to reliably of ensuring the chemical safety in transport. The researches showed that the most widely used in the modern transport are composite polyesters (23,2%), polyamide and fiberglass (17,4%), PVC (13,7%) materials. The most dangerous in the toxicological and hygienic sense were fiberglass, polyvinylchloride and paper-laminate plastics, which is due to the kinetics of the migration of chemical compounds and their high saturation in transport objects.

Total pollution of the passenger wagons with volatile compounds (the sum of the ratios of the concentrations found for all substances to their TLV in the atmosphere) ranged from 4,2 to 11,8 points (the standard – 1.0). The peculiarities of the formation of chemical pollution in the spatial and temporal aspect, taking into account the exploitation periods, were associated with the polymer matrix and solvents, In the long term operation the hygienically significant components are flame retardants, plasticizers, heavy metals as stabilizers and pigments, etc. The research has established significant dose-time dependent differences in the toxic effects of occupationally caused components, on the one hand, and in terms of exploitation of transport facilities, on the other. For the first characteristic, traditional dysadaptative and pathological effects are predominantly of a integral toxicity, whereas in the second one - there are developing predominantly disregulation shifts.

Combined effects in the chronic exposure of animals are accompanied by an increase in toxic-allergenic processes with signs of cumulative effects, mainly at later periods of exposure and are caused not only by damaging, but also by signaling and modulating mechanisms of interacting toxicants action, especially taking into account the developing of endothelial dysfunction, indicating the systemic nature of the observed changes. In general, the performed researches have shown that "low intensity" polymeric factors, in contrast to chemical substances of industrial origin, especially in combined action, exhibit predominantly neurotoxic, immune, nephrotoxic effects, signs of endothelial dysfunction with cellular cooperation and viability discoordination, and also act as endocrine disruptors. The revealed mechanisms of the combined action of the polymeric materials components at different levels of biological organization contribute to the formation of a systemic response at the organism level, which can be regarded as the formation of systemic dysregulation pathology. The established regularities

have allowed to recommend the new informative and sensitive biomarkers for use in the course of complex tests of polymers of transport assignment.

Thus, the revised notion of the polymeric materials and products hygienic regulation allows us to move from predominantly controlling to managerial functions, which, in accordance with the International Program “Toxicity testing-21” expressed in a market economy, opens up the opportunity for manufacturers and operators to combine the responsibility for quality and safety with an interest in improving the efficiency of the set of preventive measures.

**Key words:** polymeric materials, transport, chemical safety, combined action, factors of low intensity, dysregulation pathology, hygienic regulation.