EDITORIAL

Reduction of Health and Environmental Risks by Substitution of Hazardous Chemical Substances

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It has already been nearly 10 years since the REACH Regulation (EC regulation 1907/2006) entered into force in 2007, having the purpose to ensure a high level of protection of human health and environment as well as free circulation of substances on the internal market while enhancing competitiveness and innovation. The final deadline for registration of substances, supplied to the market in amounts from 1 tonne to 100 tonnes, is approaching in 2018. After then, a complete picture of chemicals used in Europe will be available. According to the data of the European Chemicals Agency (ECHA), until June 2016, 9,472 unique substances were registered following submission of a registration dossier; 3,790 substances were claimed by the notifiers of those substances that had been notified under the previous European chemicals legislation (so-called NONS). Thus, in total there were 13,262 chemical substances registered under the REACH. Companies from Germany contributed to the registration of the biggest number of substances (5,149), followed by the United Kingdom (2,249 substances). Lithuanian companies participated in the registration of 105 chemical substances (NONS excluded); Estonia registered 70 and Latvia 48.

Everything around us consists of chemicals; chemicals are used in technological processes and included into products because of their useful properties: they may provide strength or plasticity, give colour, preserve products, etc. At the same time, toxicological, ecotoxicological, or physico-chemical hazards may be the intrinsic properties of chemical substances. To protect humans from these hazards, chemicals have to be handled in a suitable way so that exposure can be reduced to an acceptable level. Or, hazardous chemical substances need to be replaced by safer alternatives. Replacement of hazardous substances in products and processes by less hazardous or non-hazardous substances, or by achieving an equivalent functionality via technological or organisational measures, is called substitution. It is at the top of the hierarchy of control measures applied to substances or mixtures, meaning that the greatest value is in hazard avoidance, not exposure controls.

The EU REACH Regulation calls for substitution of the most hazardous substances, called substances of very high concern (SVHCs). These are substances which are carcinogenic, mutagenic and reprotoxic (CMR), or persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB), or which have other properties giving rise to an equivalent level of concern (e.g. endocrine disruptors or respiratory sensitisers). Other legal acts also stipulate substitution (e.g. carcinogens and mutagens shall be substituted according to Carcinogens and Mutagens Directive, 2004/37/EC). Less hazardous substances may also be replaced, since substitution is a general recommendation.

Of the registered substances, 168 chemical substances up to now have been identified as being SVHCs and placed on the Candidate list; 31 of them have been placed on the Authorisation list. Candidate substances

might end up in the Authorisation list; once a substance appears on the Authorisation list, after a given date, companies will not be allowed to place it on the market or use it, unless they are granted an authorisation. An element of authorisation under the REACH Regulation aims at encouraging substitution of the most hazardous chemical substances. According to the ECHA's evaluation, relatively few companies have applied for an authorisation to use substances that have been included into the Authorisation list by now, indicating that these substances could have been phased out.

Screening of hazardous substances, prioritised under various frameworks (e.g. Water Framework Directive, HELCOM, Baltic Sea Action Plan), when implementing BaltActHaz project in 2009-2012 (co-financed with the contribution of the LIFE+ financial instrument of the EC: http://www.baltacthaz.bef.ee/), revealed their presence in emissions from various industry branches in the Baltic States, which indicates that substances were still in use. Substances that are currently included into the Authorisation list were also among the investigated substances, e.g. bis(2-ethylhexyl) phthalate - DEHP. For instance, in Lithuania, DEHP has been found in effluents from paint production, metal processing, plastic industry, construction materials industry, shipyards, car washing, etc. The widespread presence of DEHP in products has been confirmed by finding it in effluents from households, supermarkets, and in leakage from landfills. DEHP has been included into the State Monitoring Programme of surface water bodies since 2010, and it has been found in the majority of the investigated samples. Even more, exceeding of Environmental Quality Standards (EQS) was observed in coastal waters of the Baltic Sea in 2010, in the Curonian Lagoon (50% of samples), and in the River Nemunas in 2 monitoring sites (17% of samples) in 2011. These findings once again confirm the need and importance of substitution.

FIT for the REACH (Baltic pilot cases on reduction of emissions by substitution of hazardous chemicals and resource efficiency) project, co-financed with the contribution of the LIFE+ financial instrument of the European Communities, project no. LIFE14 ENV/LV/000174, is one of the research and practical implementation activities carried out in the EU to speed up the process of phasing out hazardous chemical substances (www.fitreach.eu).

From the end of 2015 to the beginning of 2020, the project team consisting of non-profit environmental organisations, research institutions and companies themselves, which use hazardous chemical substances, will concentrate on the issue of substitution. Suitable alternatives will be found for the identified substances requiring substitution; alternatives will be tested taking into account technological feasibility, environmental impact, and socio-economic acceptability. The project team intends to demonstrate successful substitution cases and contribute to reduction of health and environmental risks.