

Skin irritation potential and biocompatibility of complex mixtures

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Abstract

Skin irritation refers to the production of reversible damage to the skin occurring after exposure to a substance or mixture. OECD TG 439 was introduced in 2010 as an *in vitro* test method for the hazard identification of irritant chemicals to replace the *in vivo* rabbit skin irritation test or to be used as a partial replacement test within a testing strategy. OECD TG 439 is applicable to solids, liquids, semi-solids and waxes and is theoretically applicable to both substances and mixtures, even if limited information on mixture testing is available and results obtained with mixtures should be discussed to evaluate their scientific means (e.g. botanicals).

Biocompatibility is a more general term identifying the tests required by ISO 10993 for the evaluation of the safety of the materials used in the biomedical field. These tests are meant to highlight the potential and predictable risks associated with the human use. One of the toxicological endpoints to be considered is irritation, in particular skin irritation (ISO 10993:1).

Medical devices however have a very broad formulation types: they could be with solid, not soluble polymeric materials which cannot be tested as such but need to be extracted in proper solvents (polar and apolar) prior testing (ISO 10993:12). In such complex extracts, chemical/contaminants/leachable concentrations may vary, be present in low concentrations and be difficult to detect and identify. In order to develop an alternative protocol to the *in vivo* skin irritation assay sensitive enough for the assessment of the irritation potential of medical device extracts, the incubation time used on RhE methods in OECD TG 439 has been extended up to 18–24 h. The adapted protocols demonstrated to be suitable for the detection of irritants in diluted polymeric mixtures (De Jong 2018) and that the methods can be used as first instance to address the irritation potential of medical devices and their extracts (new ISO 10993:23).

The presentation will include as case study the evaluation of the irritation potential of Secondary Raw Materials, that for their chemical-physical characteristics and for their potential presence of contaminants/leachable derived from their origin and recycling process can be considered an interesting example of complex mixture.