ROSIN AND SKIN SENSITISATION
A Sensitive Subject

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Introduction

In 1967 the classification and labelling of hazardous chemicals was harmonised in the EU by the Dangerous Substances Directive (67/548/EEC). Since then the Directive has been amended 7 times. Also the Directive is regularly updated for progress made on technical issues and (re) classifications of dangerous substances. These changes are called Adaptations to Technical Progress (ATP). The 30th ATP is currently in preparation.

The European Commission is responsible for the adoption and implementation of amendments and ATP’s, but they have delegated the administrative handling of ATP’s to the Technical Progress Committee (TPC). The TPC consists of a group delegates from all EU Member States, who prepare a formal advice for a new ATP to the Commission. The TPC installed a Working Group on the Classification and Labelling of Dangerous Substances (WG) to evaluate hazardous properties of chemical substances. The WG consists of experts delegated by the EU Member States.

The initiative to investigate a substance can come from one of the members of the WG, but it may also come as a request from the Commission. Investigations may also be based on data submitted by industry.

Rosin

In May 1990 the Danish authorities published a review on the sensitising properties of rosin, based on published literature. The conclusion of the review was that rosin complied with the criteria that it was a skin sensitiser. Even though the report reported that "Colophony cannot on this basis be classified as sensitising by inhalation", it was classified as a skin and respiratory sensitiser (R42/43) in 1993.

Industry lobbied effectively against the classification of rosin as a respiratory sensitiser, which resulted in its declassification in 1994.

In their discussions, the WG indicated that all 210 rosin and rosin derivative entries in EINECS containing the word “rosin” would be classified as skin sensitisers. The Chemical industry, lead by the Hydrocarbon and Rosin Resin Producers Association (HARRPA), argued that classification would be highly inappropriate. HARRPA offered to carry out an extensive literature investigation and set up a testing plan to close data gaps. The offering was accepted by the WG.

During the investigation of the public literature, it became clear that in most cases the integrity of the test samples was doubtful at best. Also, in an important research project, the test methodology was adapted in order to detect very weak skin sensitisers. The publications did not indicate what the actual changes in the methodology were.
Having defined the data gaps, HARRPA started its testing programme. As 2 methods of testing were regulated in the EU, the Guinea Pig Maximisation Test (GPMT) and the Buehler Test, HARRPA carried out a study to establish which was the most sensitive. In order to compare the methods, rosin was chosen as it is structurally similar to the derivatives, and at the time of testing, was classified as a skin sensitiser. Even after repeating the tests, the result was that not a single animal showed any signs of skin sensitisation.

A closer investigation of the literature indicated that oxidation of rosin played an important role in positive sensitisation results. After oxidising rosin deliberately, the GPMT turned out to be positive. Beyond any scientific doubt it was proven that rosin itself is not a skin sensitiser in the GPMT and Buehler tests. Oxidised rosin was a skin sensitiser in the GPMT, but wasn’t tested in the Buehler test.

In a later stage of the project, rosin was tested with the newly developed Local Lymph Node Assay (LLNA). This test method is currently the preferred test method in the European Union, because it was designed to spot the induction of skin sensitisation. At the highest possible test concentration neither rosin nor oxidised rosin gave a positive response, i.e. rosin and oxidised rosin were not skin sensitisers in this test.

For risk assessment purposes it is important to know whether oxidised rosin may pose a threat to human health. The fact that in the GPMT the test material is injected intradermally, whereas in the Buehler test and the LLNA the test material is applied on intact skin and the fact that only the GPMT shows a positive effect, is a hint that the skin barrier plays an important if not critical role. Based on the negative results of the LLNA and Buehler, and taking into account the years of experience with workplace exposures, the weight of the evidence suggests that rosin is not a sensitiser.

As oxidised rosin is an individual entry in EINECS and based on the fact that hazard classification must be based on the intrinsic properties of the substance, HARRPA submitted a request to the WG to correctly apply the Dangerous Substances Directive to the case of rosin and oxidised rosin. As can be read in the minutes of the October 1999 meeting of the WG, it recognised that declassification of rosin as a skin sensitiser is scientifically justified. However, it was argued that declassification “would decrease the level of protection within the present regulatory system and the available means of control” and therefore the entry in Annex I to the dangerous substances directive was maintained.

HARRPA challenged the decision of the WG at the levels of the Working Group, the Technical Progress Committee and finally the European Commission itself. Even though the decision was clearly faulty, HARRPA’s challenge failed in every instance. Finally, some HARRPA members have taken the case to the European Court of Justice. The case is still on-going.

**Rosin Derivatives**

Rosin derivatives are individual entries in EINECS. They are complex mixtures containing hundreds of components. Because of this complexity it is physically impossible to separate rosin derivatives from any unreacted material. Therefore, rosin derivatives, in analogy to petroleum distillates, are to be regarded as “pure substances”, whereby any unreacted raw material forms an integral part of the derivative. Therefore, they can not be regarded as a
preparation in the sense of the Dangerous Preparations Directive. Also, unreacted raw material should not be regarded as an impurity. Unless there data in support to classification, rosin derivatives are not classified as skin sensitisers by default.

HARRPA has carried out an extensive test programme using the LLNA test method. Only two rosin derivatives were positive: maleic anhydride modified rosin and fumaric acid modified rosin. A third rosin derivative, rosin amine, was not tested as it is strongly corrosive.

**Conclusion**

Beyond any scientific doubt HARRPA has proven that rosin is not a skin sensitiser in any of the tests.

The classification of rosin as a skin sensitiser is scientifically, as well as from a regulatory point of view, faulty. Oxidised rosin, as an individual EINECS entry, should be classified as a skin sensitiser. In the face of conflicting results, the weight of the evidence suggests that rosin is not a sensitiser.

Because of the complex nature of rosin derivatives and the outcome of the LLNA tests, they are not to be classified as skin sensitisers, with the exception of fumaric and maleic modified rosin. Rosin amine is corrosive and therefore can not be tested for sensitisation.

Rosin and rosin derivatives, with the exceptions mentioned in the previous paragraph, can safely be used in adhesives.