Process for the protection of a person against contamination as a result of improper, i.e. oral, application of toxic components of a transdermal therapeutic system, as well as transdermal therapeutic systems containing a denaturant

The invention relates to a process for the protection of a person against contamination as a result of improper, i.e. oral, application of toxic components of a transdermal therapeutic system (TTS), comprising at least one active substance-containing, especially pressure-sensitive adhesive layer and at least one further, active substance-impermeable backing layer, as well as a TTS containing a denaturant.

A series of TTS present an acute danger of undesired side effects if administered orally by a person in order to extract a soluble active agent - either from a new system or a used one. Infants, for example, have a tendency to stick anything interesting into their mouth and to at least suck or chew on it. This cannot be avoided especially if children happen to attain access to such systems by chance, especially systems without a release liner.
Such incidents have not yet been known to occur, but the pharmaceutical authorities increasingly fear that they might and have therefore, in various instances, demanded childproof packages. Such childproof packages have, in fact, been developed in various embodiments. However, they do not protect a child from putting a TTS in its mouth once the package has been opened or if the child somehow gets hold of a used patch. Especially in the case of TTS with active substances such as anesthetics, analgesics, tranquilizers or psychopharmacological agents, an oral abuse can lead to serious health impairments. On the other

hand, addicts could be tempted to extract such active agents from transdermal therapeutic systems by means of sucking of chewing.

It is known that drinkable ethyl alcohol can be denatured and then put on the market as methylated spirit. A denaturing of pharmaceutical active agents, on the other hand, has not yet been published.

It is the object of the invention to develop a process for the protection of a person of the kind mentioned in the introductory part of Claim 1 in a way that makes an oral abuse of the kind mentioned above impossible, at the same time, however, avoiding a disadvantageous change in the system's therapeutic active agent and also ruling out an impairment of health in the case of improper, i.e. oral, application.

To achieve this object, the process according to the invention proposes the addition of a therapeutically neutral, non-interacting substance with a disgusting taste. Because this substance causes extremely unpleasant and unexpected experiences with respect to taste, a first oral contact with the TTS according to the invention or with one of its denatured layers is sufficient for achieving a spontaneous reaction with the effect of immediately spitting out the corresponding patch and thus for preventing children or drug addicts from an improper, i.e. oral, application of the active substance contained in the patch.

One embodiment provides that a substance is used for the denaturation of a TTS which causes nausea and thus spoils the temptation of oral application for the person concerned.

Another embodiment of the process according to the invention provides that the substance is applied on top of the active substance-containing layer in a separate, extremely thin layer which does not prevent the permeation of the active substance.
This has the benefit that the experiencing of an extremely disgusting taste directly upon first contact of the TTS with the oral mucosa or the tongue will dissuade further oral contact before a contamination through the active substance-containing layer can occur.

As a further measure, the substance can additionally be applied to the backing layer in a separate, preferably very thin layer, thus safely achieving a further intensification of the effect of denaturation.

In this case, the separate substance layer is to be applied in a thickness of between 10 and 100 µm, preferably between 5 and 20 µm.

An especially advantageous embodiment of the invention further provides for the use of a substance which causes an irritation such as a burning of the oral mucosa and the tongue. One such negative experience should suffice to lastingly dissuade a child or an addict from further attempts at oral contact with a TTS. A similar effect can also be achieved if a substance is used which causes an intensely bitter taste and especially aftertaste.

An effective embodiment of the process according to the invention provides for the use of gallic acid, quinine, tannin, angostura, (pure) caffeine, lobeline, tea tree oil, certain hyphomycete cultures, denatured or coagulated substances, turpentine or ammonia as amaroids or substances

with a disgusting taste for the denaturation of at least one layer of a TSS.

For the implementation of one embodiment of the process, the invention provides for the incorporation of the substances used for denaturation in a film layer with which the active substance-containing layer and, depending on the case, also the backing layer are coated. An especially advantageous solution provides for the use of a film layer soluble in saliva.

The process is uncomplicated and effective and protects children and/or addicts against improper, i.e. oral, application of toxic components of a transdermal therapeutic system. Thus, the process and the TTS according to the invention present an ideal means of achieving the object as mentioned above.

CLAIMS

1. Process for the protection of a person against contamination as a result of improper, i.e. oral, application of toxic components of a transdermal therapeutic system (TTS), comprising at least one active substance-containing, especially pressure-sensitive adhesive layer and at least one further, active substance-impermeable backing layer, characterized by the addition of a therapeutically neutral, non-interacting substance with a disgusting taste.

2. Process according to claim 1, characterized in that the substance with the disgusting taste is added at least to the active substance-containing layer.

3. Process according to claim 1 or 2, characterized in that the substances used for denaturation are incorporated in a film layer with which the active substance-containing layer and, depending on the case, also the backing layer are coated.

4. Process according to claim 3, characterized in the use of a film layer soluble in saliva.

5. Process according to one or more of the claims 1 to 4, characterized by the use of a substance which causes nausea.

6. Process according to one or more of the claims 1 to 5, characterized in that the substance is applied on top of the active substance-containing layer in a separate, extremely thin layer which does not prevent the permeation of the active substance.

7. Process according to one or more of the claims 1 to 6, characterized by the additional application of the substance to the backing layer in a separate, extremely thin layer.

8. Process according to one or more of the claims 1 to 7, characterized by the application of the separate substance layer in a thickness of between 10 and 100 µm and preferably between 5 and 20 µm.

9. Process according to one or more of the claims 1 to 8, characterized by the use of a substance which causes an irritation such as a burning of the oral mucosa and the tongue.

10. Process according to one or more of the claims 1 to 9, characterized by the use of a substance which causes an intensely bitter taste and especially aftertaste.

11. Process according to one or more of the claims 1 to 10, characterized by the use of gallic acid, quinine, tannin, angostura, (pure) caffeine, lobeline, tea tree oil, hyphomycete cultures, denatured or coagulated substances, turpentine or ammonia as amaroids or substances with a disgusting taste for the denaturation of at least one layer of a TTS.

12. TTS comprising at least one active substance-containing, especially pressure-sensitive adhesive layer and at least one further, active substance-impermeable backing layer, containing a denaturant.