

Such a concentrated application of an active pharmaceutical ingredient directly onto the mucous membrane can be achieved with dosage forms which contain the active pharmaceutical ingredient in a sheet like, in particular film shaped, foil shaped or wafer shaped preparation, in particular as a so-called wafer. Drawbacks of conventional wafers are, particularly, that known wafers dissolve partially or completely before the site of action and in particular for e.g. intestinal, rectal or vaginal wafers no contact with the mucous membrane can be guaranteed. Moreover, for e.g. intestinal, rectal and vaginal multilayered wafers no contact with the correct site of the wafer and in particular no sufficiently long contact with the mucous membrane can be guaranteed.

Summary

In one aspect, the present invention refers to a pharmaceutical dosage form for the application to a buccal, gastrointestinal, or an esophageal mucous membrane, comprising at least one sheet-like preparation comprising an active pharmaceutical ingredient, a release mechanism and a trigger mechanism, wherein the trigger mechanism is adapted to trigger, at a predetermined site of action of the gastrointestinal tract, the release of the sheet-like preparation by the release mechanism, wherein the pharmaceutical dosage form further comprises a shell, wherein the shell contains the sheet-like preparation comprising the active pharmaceutical ingredient, and wherein the shell comprises at least one aperture configured such that the sheet-like preparation is releasable from the shell through the aperture upon release of the sheet-like preparation, wherein the aperture is in particular formed as a slit, wherein the aperture forms a part of the release mechanism configured to allow said preparation to leave the shell, such that the sheet like preparation is unrolled or unfolded while the dosage form moves down the esophageal mucous membrane and leaves the shell through the aperture.

In another aspect, the present invention refers to a pharmaceutical dosage form for application to a rectal or vaginal mucous membrane, comprising at least one sheet-like preparation comprising an active pharmaceutical ingredient, a release mechanism and a trigger mechanism, wherein the trigger mechanism is adapted to trigger, at a predetermined site of action of the gastrointestinal tract, of the rectum or of the vagina, the release of the sheet-like preparation by the release mechanism, wherein the pharmaceutical dosage form further comprises a shell, wherein the shell contains the sheet-like preparation comprising the active pharmaceutical ingredient, and wherein the shell comprises at least one aperture through which a fluid surrounding the shell can come into contact with an inner space of the shell, wherein the aperture is formed as a slit and/or the aperture is at least partially covered by the trigger mechanism, wherein the release mechanism is an expansion mechanism, wherein the expansion mechanism is selected from the group comprising a mechanical expansion system, a gas driven expansion system, compressed foam or compressed tissue, and wherein an expansion of the expansion mechanism results in an opening of the shell.

Claims

1. A pharmaceutical dosage form for application to a buccal, gastrointestinal, or an esophageal mucous membrane, comprising

at least one sheet-like preparation comprising an active pharmaceutical ingredient,

a release mechanism and

a trigger mechanism, wherein

the trigger mechanism is adapted to trigger, at a predetermined site of action of the gastrointestinal tract, the release of the sheet-like preparation by the release mechanism,

wherein the pharmaceutical dosage form further comprises a shell, wherein the shell contains the sheet-like preparation comprising the active pharmaceutical ingredient, and wherein the shell comprises at least one aperture configured such that the sheet-like preparation is releasable from the shell through the aperture upon release of the sheet-like preparation, wherein the aperture is in particular formed as a slit,

wherein the aperture forms a part of the release mechanism configured to allow said preparation to leave the shell, such that the sheet like preparation is unrolled or unfolded while the dosage form moves down the esophageal mucous membrane and leaves the shell through the aperture.

2. A pharmaceutical dosage form for application to a rectal or vaginal mucous membrane, comprising

at least one sheet-like preparation comprising an active pharmaceutical ingredient,

a release mechanism and

a trigger mechanism, wherein

the trigger mechanism is adapted to trigger, at a predetermined site of action of the gastrointestinal tract, of the rectum or of the vagina, the release of the sheet-like preparation by the release mechanism,

wherein the pharmaceutical dosage form further comprises a shell, wherein the shell contains the sheet-like preparation comprising the active pharmaceutical ingredient, and wherein the shell comprises at least one aperture through which a fluid surrounding the shell can come into contact with an inner space of the shell, wherein

the aperture is formed as a slit and/or the aperture is at least partially covered by the trigger mechanism,

wherein the release mechanism is an expansion mechanism, wherein the expansion mechanism is selected from the group comprising a mechanical expansion system, a gas driven expansion system, compressed foam or compressed tissue, and wherein an expansion of the expansion mechanism results in an opening of the shell.

3. A pharmaceutical dosage form according to claim 1 or 2, wherein

the trigger mechanism is adapted to trigger the release of the sheet-like preparation by the release mechanism after a contact of the pharmaceutical dosage form with a key stimulus and/or

the trigger mechanism is adapted to trigger the release of the sheet-like preparation by the release mechanism in a time controlled manner or immediately and/or

the release mechanism is adapted to release the sheet-like preparation in a time controlled manner or immediately after triggering of the trigger mechanism.

4. A pharmaceutical dosage form according to claim 1 or 2, wherein the dosage form contains the preparation in a folded form and the expansion of the expansion mechanism results in an unfolding of the preparation.

5. A pharmaceutical dosage form according to claim 1 or 2, wherein the shell contains a gas-forming agent as the release mechanism and as the expansion mechanism, and the gas-forming agent is arranged in a part of the shell that is opposed to the part of the shell containing the preparation, or

wherein the shell comprises a mechanical expansion system and wherein the mechanical expansion system comprises at least a first joint or lever element and/or at least one spring element, or

wherein the shell at least comprises a first tube element, and the shell at least comprises a second tube element, wherein the second tube element has a smaller tube diameter than the first tube element, and wherein the second tube element is arranged at least partially in the first tube element, and the shell further comprises a

spring element, wherein the spring element is arranged such that the spring element can move the at least one second tube element longitudinally relative to the first tube element, or

wherein the expansion mechanism comprises at least a joint or lever element, and wherein the mechanical expansion system comprises at least a further joint or lever element, wherein the first joint or lever element and/or the further joint or lever element is arranged at a free end of the shell.

6. A pharmaceutical dosage form according to claim 1 or 2, wherein the preparation comprises a swelling agent wherein the swelling agent is selected from the group comprising sponge and fibers.

7. A pharmaceutical dosage form according to claim 5, wherein the first joint or lever element and/or the further joint or lever element is at least partially covered by the trigger mechanism and/or wherein the at least one first joint or lever element or the at least one further joint or lever element is arranged such that a joint or lever element of one end is arranged adjacent to a respective joint or lever element of the other end.

8. A pharmaceutical dosage form according to claim 1 or 2, wherein:

the sheet-like preparation provides, after its release by the release mechanism, a relatively large surface area compared to the volume of the sheet like preparation, and provides an advantageously increased surface area for the resorption of the pharmaceutical ingredient at the site of action; and/or

the release mechanism is adapted to release, at least partially, the sheet-like preparation while moving along the mucous membrane.

9. A pharmaceutical dosage form according to claim 1 or 2, wherein:

the release mechanism comprises a string member;

the string member being expandable from a compact form, which is a folded, collapsed, rolled or coiled up form, to an expanded form, which is an unfolded, spread

out, opened up, elongated, stretched, unrolled or oblong form, upon activation of the release mechanism; and

the string member comprises, at least in the compact form, the sheet-like preparation.

- 5 10. A pharmaceutical dosage form according to claim 1 or 2, wherein:
- the release mechanism is an expansion mechanism and an elongation mechanism adapted to unfold, elongate, uncoil, unroll or unwind the sheet-like preparation by leveraging an external movement, force or pressure.
- 10 11. A pharmaceutical dosage form according to claim 1 or 2, wherein the trigger mechanism is a holding device that is a part of or is attached to the sheet-like preparation.
- 15 12. A pharmaceutical dosage form according to claim 1, for the oral administration, wherein the trigger mechanism and the holding device are adapted to be fixed in an oral cavity and/or to be held in a hand during administration of the pharmaceutical dosage form.
- 20 13. A pharmaceutical dosage form according to claim 1 or 2 for the oral administration, wherein, at least during the release of the sheet-like preparation, the released portion of the sheet-like preparation and the dosage form move relative to each other thereby defining a movement path (PM) of the dosage form, and the enveloping cross-sectional area (AD) of the dosage form, viewed in the direction of the movement path is larger than the enveloping cross-sectional area (AP) of the released part of the sheet-like preparation.
- 25 14. A pharmaceutical dosage form according to claim 1 or 2, wherein the sheet like preparation is film shaped, foil shaped or wafer shaped.
- 30 15. A pharmaceutical dosage form according to claim 3, wherein the aperture is at least partially covered by the trigger mechanism in the form of a soluble polymer, which is

adapted to trigger the release of the sheet-like preparation by the release mechanism after contacting trigger mechanism with the key stimulus.

- 5 16. A pharmaceutical dosage form according to claim 5, wherein the trigger mechanism is formed by a soluble polymer that is located at the inside of the tube elements.
17. A pharmaceutical dosage form according to claim 15, wherein the key stimulus is gastric juice, or fluid of the small intestine.
- 10 18. A pharmaceutical dosage form according to claim 1 or 2, wherein in an initial state of the dosage form, the sheet like preparation is in a compact form.
- 15 19. A pharmaceutical dosage form according to claim 1 or 2, wherein the release mechanism is formed by the part of the sheet like preparation that is inside the shell and the aperture.
- 20 20. A pharmaceutical dosage form according to claim 19, wherein the shell contains a rod and a part of the sheet like preparation is rolled or coiled around the rod and forms together with the elongated part of the sheet like preparation the release mechanism.
21. A pharmaceutical dosage form according to claim 11, wherein the holding device is attached in the oral cavity by gluing it to the mucosa.
- 25 22. A pharmaceutical dosage form according to claim 11, wherein the holding device is connected to the sheet like preparation or is a broadened part of the sheet like preparation comprising mucoadhesive polymers.