Patent Claims

1) Solid preparation comprising micronized 3-(1-{3-[5-(1-Methyl-piperidin-4-ylmethoxy)-pyrimidin-2-yl]-benzyl}-6-oxo-1,6-dihydro-pyridazin-3-yl)-benzonitrile or a pharmaceutical acceptable salt thereof and a filler , wherein 3-(1-{3-[5-(1-Methyl-piperidin-4-ylmethoxy)-pyrimidin-2-yl]-benzyl}-6-oxo-1,6-dihydro-pyridazin-3-yl)-benzonitrile or its pharmaceutical acceptable salt is present from 20 to 80 % (w/w) based upon the total weight of the solid preparation.

2) A solid preparation according to Claim 1, wherein 3-(1-{3-[5-(1-Methyl-piperidin-4-ylmethoxy)-pyrimidin-2-yl]-benzyl}-6-oxo-1,6-dihydro-pyridazin-3-yl)-benzonitrile is present in the form of its sulphate, phosphate, mesylate, besylate, tosylate, fumarate, monohydrochloride monohydrate or maleate, preferably monohydrochloride monohydrate.

3) A solid preparation according to Claim 1 or 2, wherein 3-(1-{3-[5-(1-Methyl-piperidin-4-ylmethoxy)-pyrimidin-2-yl]-benzyl}-6-oxo-1,6-dihydro-pyridazin-3-yl)-benzonitrile has a mean particle size that is characterized by a d50 value in the range from 5 µm to 80 µm, preferably from 5 µm to 50 µm and more preferably from 5 µm to 25 µm.

4) A solid preparation according to one or more of Claims 1 to 3, wherein the filler is a sugar, a sugar alcohol or dicalcium phosphate.

5) A solid preparation according to Claim 4, wherein the filler is a sugar alcohol, whereby the sugar alcohol is sorbitol and/or mannitol, preferably mannitol.

6) A solid preparation according to one or more of Claims 1 to 5, wherein the solid preparation further comprises a binder.

7) A solid preparation according to Claim 6, wherein the binder is polyvinylpyrrolidone, polyvinyl acetate, a vinylpyrrolidone-vinyl acetate copolymer, polyethylene glycol, a starch paste such as maize starch paste,

or a cellulose derivative such as hydroxypropyl methylcellulose, hydroxypropyl cellulose or microcrystalline cellulose, preferably microcrystalline cellulose.

8) A solid preparation according to one or more of Claims 1 to 7, wherein the solid formulation further comprises a lubricant.

9) A solid preparation according to Claim 8, wherein the lubricant is sodium stearyl fumarate, esters of glycerol with fatty acids, stearic acid, or pharmaceutically acceptable salts of stearic acid and divalent cations, preferably magnesium stearate.

10) A solid preparation according to one or more of Claims 1 to 9, wherein the solid preparation has a mean particle size that is characterized by a d50 value in the range from 50 µm to 1 mm, preferably from 60 µm to 800 µm and more preferably from 70 to 600 µm.

11) A pharmaceutical preparation comprising the solid preparation according to one or more of Claims 1 to 10.

12) A pharmaceutical preparation according to Claim 11, which is a pharmaceutical preparation for oral administration.

13) A pharmaceutical preparation according to Claim 11 or 12, which is an immediate release preparation.

14) A pharmaceutical preparation according to one or more of Claims 11 to 13, which is a capsule comprising the solid preparation and optionally one or more pharmaceutically acceptable excipients.

15) A pharmaceutical preparation according to Claim 14, which is a capsule, which contains 40 to 100 % (w/w) of the solid preparation according to any of claims 1 to 10; and 0 to 60 % (w/w) of at least one pharmaceutically acceptable excipient, preferably selected from a filler, a glidant, a

disintegrant and a lubricant, based upon the total weight of all material contained in the capsule.

16) A pharmaceutical preparation according to one or more of Claims 11 to 13, which is a tablet and which in addition to the pharmaceutically acceptable excipients present in the solid preparation optionally comprises one or more pharmaceutically acceptable excipient selected from a filler, a disintegrant, a glidant and a lubricant.

17) A pharmaceutical preparation according to Claim 16, which is a tablet comprising the solid preparation according to any of claims 1 to 10 and optionally further excipients, which tablet, based upon its total weight, comprises:

i) 20 to 80 % (w/w) of 3-(1-{3-[5-(1-Methyl-piperidin-4-ylmethoxy)-pyrimidin-2-yl]-benzyl}-6-oxo-1,6-dihydro-pyridazin-3-yl)-benzonitrile or a pharmaceutical acceptable salt thereof;

ii) 10 to 70 % (w/w) of a filler;

iii) 0 to 20 % (w/w) of a binder;

iv) 0 to 20 % (w/w) of disintegrant;

v) 0 to 5 % (w/w) of a lubricant;

vi) 0 to 7,5 % (w/w) of glidant; and

vii) a total of 0 to 20 % (w/w) of one or more additional pharmaceutically acceptable excipients.

18) A pharmaceutical preparation according to Claim 16 or 17, which is a tablet comprising the solid preparation according to any of claims 1 to 10 and optionally further excipients, which tablet based upon its total weight comprises:

i) 30 to 70 % (w/w) of 3-(1-{3-[5-(1-Methyl-piperidin-4-ylmethoxy)-pyrimidin-2-yl]-benzyl}-6-oxo-1,6-dihydro-pyridazin-3-yl)-benzonitrile or a pharmaceutical acceptable salt thereof;

ii) 20 to 60 % (w/w) of a filler;

iii) 0 to 10 % (w/w) of a binder;

iv) 0.25 to 10 % (w/w) of disintegrant;

v) 0 to 4 % (w/w) of a lubricant;

vi) 0 to 5 % (w/w) of a glidant; and

vii) a total of 0 to 10 % (w/w) of one or more additional pharmaceutically acceptable excipients.

19) A pharmaceutical preparation according to Claim 16, 17 or 18, which is a tablet comprising:

i) 35 to 60 % (w/w) of 3-(1-{3-[5-(1-Methyl-piperidin-4-ylmethoxy)-pyrimidin-2-yl]-benzyl}-6-oxo-1,6-dihydro-pyridazin-3-yl)-benzonitrile or a pharmaceutical acceptable salt thereof;

ii) 40 to 60 % (w/w) of a filler;

iii) 0 to 5 % (w/w) of a binder;

iv) 0.5 to 5 % (w/w) of disintegrant;

v) 0.25 to 3 % (w/w) of a lubricant;

vi) 0 to 2 % (w/w) of a glidant; and

vii) a total of 0 to 10 % (w/w) of one or more additional pharmaceutically acceptable excipients.

20) A pharmaceutical preparation according to one or more of claims 16 to 19, wherein the filler is mannitol , the binder is microcrystalline cellulose, the disintegrant is selected from crospovidone, carboxy starch glycolate, carboxymethylcellulose and salts and derivatives thereof, especially croscarmellose sodium, the lubricant is selected from magnesium stearate, calcium stearate, stearic acid, glycerol fatty acid esters and sodium stearyl fumarate and/or the glidant is selected from colloidal silicon dioxide and derivatives thereof.

21) A method for preparing the solid preparation according to any of claims 1 to 10, the method comprising dry granulating.

22) The method for preparing the solid preparation according to Claim 21, the method comprising:

(a) mixing 3-(1-{3-[5-(1-Methyl-piperidin-4-ylmethoxy)-pyrimidin-2-yl]-benzyl}-6-oxo-1,6-dihydro-pyridazin-3-yl)-benzonitrile or a pharmaceutical acceptable salt thereof and a filler and optionally one or more further pharmaceutically acceptable excipient;

(b) dry granulating the mixture prepared by step (a) to form the solid preparation; and

(c) optionally milling.

23) A method for preparing the solid preparation according to Claim 21 or 22, wherein dry granulating is roller compacting.

24) A method for preparing a pharmaceutical preparation, which is a tablet, comprising a solid preparation according to any of claims 1 to 10, comprising

(a) conducting the method according to claim 21, 22 or 23 to form the solid preparation;

(b) mixing the solid preparation and one or more pharmaceutically acceptable excipients;

(c) tableting the mixture prepared by step (b); and

(d) optionally film coating of the tablets prepared by step (c).

25) A method for preparing a pharmaceutical preparation, which is a capsule, comprising a solid preparation according to one or more of Claims 1 to 10, comprising

(a) conducting the method according to claim 21, 22 or 23 to form the solid preparation;

(b) optionally mixing the solid preparation and one or more pharmaceutically acceptable excipient; and

(c) filling the solid preparation prepared by step (a) or the mixture prepared by step (b) into capsules.

26) The pharmaceutical preparation according to one or more of Claims 11 to 20 for use in the treatment of cancer optionally together with radiotherapy.

27) The pharmaceutical preparation for use in the treatment of cancer according to Claim 26, wherein the treatment further comprises chemotherapy.

28) The pharmaceutical preparation for use in the treatment of cancer according to Claim 26 or 27, wherein the treatment further comprises immunotherapy.