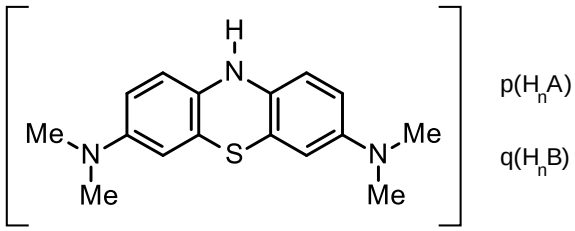
Claims

1. Use of an MT-containing compound in the manufacture of a medicament for use in a ~~A~~ method of alleviating hypoxemia in a subject,

which method comprises orally administering to said subject a methylthioninium (MT)-containing compound,

wherein said administration provides a total daily oral dose of 0.5 mg to 250 mg of MT to the subject per day, optionally split into 2 or more doses,

wherein the MT-containing compound ~~is an LMTX compound of~~has the following formula:



wherein each of H_nA and H_nB (where present) are protic acids which may be the same or different,
and wherein p = 1 or 2; q = 0 or 1; n = 1 or 2; (p + q) × n = 2,
or a hydrate or solvate thereof.

***

2. ~~A method~~The use as claimed in claim 1 wherein the total daily dose is:
(i) greater than 35, 40, 50, or 60 mg and less than or equal to 250 mg of MT to the subject per day; and/or
(ii) greater than or equal to about 30.5, 30.6, 31, 35, 37.5, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 140, 150, 160, 170, 180, 200, 210, 220, 230, 240, or 250 mg MT.

3. ~~A method~~The use as claimed in claim 1 or claim 2 wherein the total daily dose is about 60, 75, or 120 mg MT.

***

4. ~~A method~~The use as claimed in claim 1 wherein the total daily dose is from about any of 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4 mg to about any of 5, 6, 7, 8, 9, 10 mg.

5. ~~A method~~The use as claimed in claim 4 wherein the total daily dosage is 3 to 10 mg or ~~.~~

~~6. A method as claimed in claim 4 wherein~~ the total daily dosage is 3.5 to 7 mg.

6~~7~~ ~~A method~~The use as claimed in claim 4 wherein the total daily dose is about 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 5, 6, 7, 8, 9, or 10 mg, optionally ~~.~~

~~8. A method as claimed in claim 4 wherein the total daily dosage is~~ 4, 5, 6, 7, or 8 mg.

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7~~9~~. ~~A method~~The use as claimed in any one of claims 1 to 6~~8~~ wherein the total daily dose of the compound is administered as a split dose twice a day or three times a day.

***

8~~10~~. ~~A method~~The use as claimed in any one of claims 1 to 7~~9~~ wherein the subject has a blood oxygen saturation level (SpO2) of less than 95% on room air, optionally less than or equal to 94%, 93%, 92%, 91% or 90%, and the method optionally~~.~~

~~11. A method as claimed in claim 10~~ comprises~~ing~~ the step of selecting the subject according to their SpO2 value.

9~~12~~. ~~A method~~The use as claimed in any one of claims 1 to 8~~11~~ wherein the subject is selected from: a hypotensive subject whose systolic BP is less than 80mmHg; a subject in respiratory or cardiac arrest; a neonatal patient in distress; a subject with suspected sickle cell crisis; a subject with carbon monoxide poisoning.

***

10~~13~~. ~~A method~~The use as claimed in any one of claims 1 to ~~12~~9 which enhances oxygen carrying capacity of the blood thereby increasing oxygen saturation in the blood, ~~optionally~~ within 4 hours.

~~14~~11. ~~A method~~The use as claimed in any one of claims 1 to 10~~13~~ to treat a disease or pathology resulting in, or arising from, hypoxemia.

~~15~~12. ~~A method~~The use as claimed in any one of claims 1 to ~~14~~ 11 to treat a disease or pathology causing or resulting from hypoxia or anoxia, or treat a subject diagnosed with a disease or pathology resulting in, or arising from, hypoxemia, optionally wherein~~.~~

~~16. A method as claimed in claim 15 wherein~~ the hypoxia is selected from anemic hypoxia, hypoxic hypoxia or stagnant hypoxia.

13~~17~~. ~~A method~~The use as claimed in any one of claims 1 to ~~16~~ 12 to treat a diseases or pathology requiring long-term oxygen therapy.

14~~18~~. ~~A method~~The use as claimed in any one of claims 11~~14~~ to 13~~17~~ wherein the disease or pathology is selected from: anaemia; ARDS (Acute respiratory distress syndrome); asbestosis; asthma; bronchitis; carbon monoxide poisoning; cerebral hypoxia;

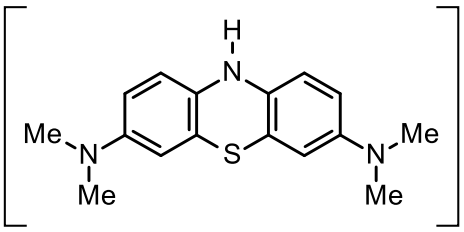
cerebral hypoxia induced by excessive G forces (G-LOC); congenital heart defects in children; congenital heart disease in adults; congestive cardiac failure; COPD (chronic obstructive pulmonary disease); COVID-19; cyanide poisoning; cystic fibrosis; emphysema; histotoxic hypoxia; hypoventilation training; insomnia; intermittent angioedema; interstitial lung disease; intrauterine hypoxia; ischaemic hypoxia; lung injury, caused by trauma or infection, which is optionally bacterial, viral or fungal; adverse response to medication that depresses breathing; pneumonia; pneumothorax; pulmonary oedema; pulmonary embolism; pulmonary fibrosis; pulmonary hypertension; respiratory alkalosis; sleep apnoea; transient ischaemic attack; tuberculosis; tumour hypoxia.

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~~19~~15. ~~A method~~The use as claimed in any one of claims 1 to ~~18~~ 14 wherein the MT-containing compound is used in combination with supplementary oxygen therapy.

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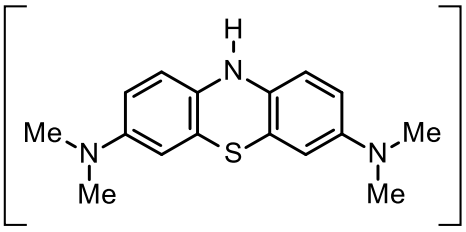
~~20~~16. ~~A method~~The use as claimed in any one of claims 1 to ~~19~~ 15 wherein the MT-containing compound has the following formula, where HA and HB are different mono-protic acids:



HA

HB

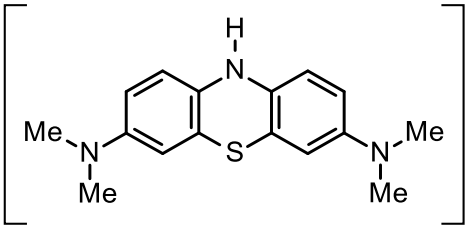
~~17~~21. ~~A method~~The use as claimed in any one of claims 1 to ~~15~~19 wherein the MT-containing compound has the following formula:



$p(H_nX)$

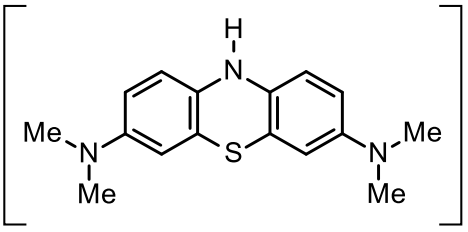
wherein each of H_nX is a protic acid.

~~18~~22. ~~A method~~The use as claimed in any one of claims 1 to ~~19~~ 15 wherein the MT-containing compound has the following formula and H_2A is a di-protic acid:



H_2A

~~23~~19. ~~A method~~The use as claimed in claim 17~~21~~ wherein the MT-containing compound has the following formula and is a bis-monoprotic acid:



2(HA)

~~24~~20. ~~A method~~The use as claimed in any one of claims 1 to ~~23~~ 19 wherein the or each protic acid is an inorganic acid.

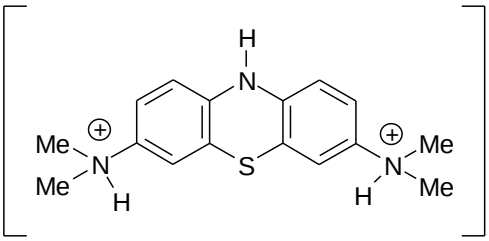
21~~25~~. ~~A method~~The use as claimed in claim ~~24~~ 20 wherein each protic acid is a hydrohalide acid and/or~~.~~

~~26. A method as claimed in claim 24 wherein~~ the or each protic acid is selected from HCl; HBr; HNO_3; H_2SO_4.

22~~27~~. ~~A method~~The use as claimed in any one of claims 1 to ~~23~~ 19 wherein the or each protic acid is an organic acid and/or~~.~~

~~28. A method as claimed in claim 27 wherein~~ the or each protic acid is selected from H_2CO_3; CH_3COOH; methanesulfonic acid, 1,2-ethanedisulfonic acid, ethansulfonic acid, naphthalenedisulfonic acid, p-toluenesulfonic acid.

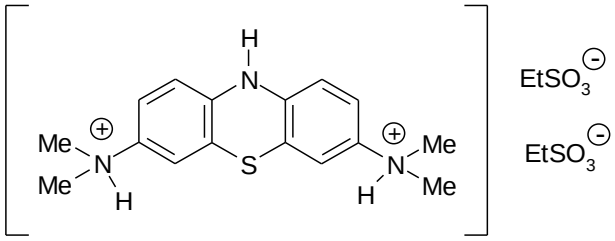
23~~29~~. ~~A method~~The use as claimed in any one of claims 1 to 19~~23~~, or claim 22~~28~~ wherein the MT-containing compound is LMTM:

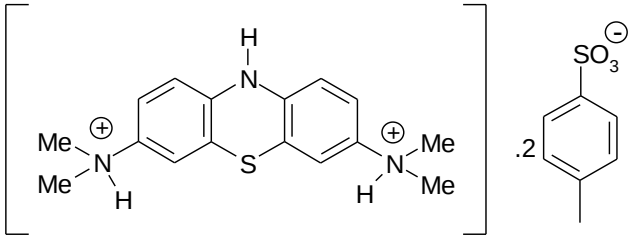


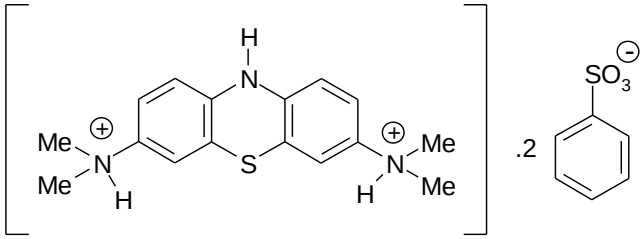
$MeSO_3^{\ominus}$

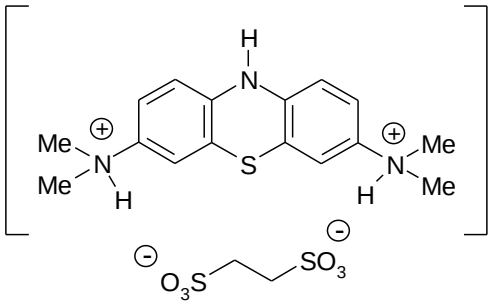
$MeSO_3^{\ominus}$

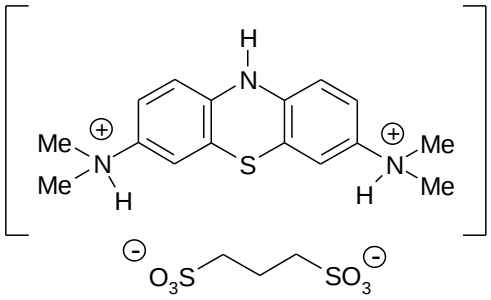
2430. ~~A method~~The use as claimed in any one of claims 1 to 1923 wherein the MT-containing compound is selected from the list consisting of:

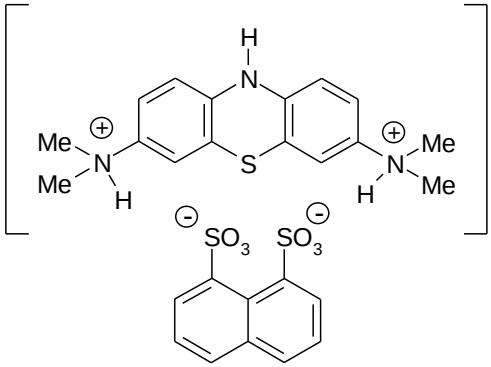












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~~31. An MT-containing compound as defined in any one of claims 1 to 30, for use in a method of treatment as defined in any one of claims 1 to 30.~~

~~32. Use of an MT-containing compound as defined in any one of claims 1 to 30, in the manufacture of a medicament for use in a method of treatment as defined in any one of claims 1 to 30.~~