

WHAT IS CLAIMED IS:

1. A method of manufacturing, making, or formulating an aqueous suspension, the method comprising:
- 5 providing a dry blended preparation comprising at least one hydrophobic amino acid entity, and a wetting agent; and
- combining the dry blended preparation, the wetting agent, and water to form an aqueous suspension that achieves a standard for suspension uniformity,
- wherein the aqueous suspension has a volume less than or equal to 8, 7, 6, 5, 4, 3, 2,
- 10 1, or 0.5 ounces, and one or both of:
- i) an overall amino acid concentration of at least 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7, 7.5, 8, 8.5, 9, 9.5, 10, 10.5, 11, 11.5, 12, 12.5, 13, 13.5, 14, 14.5, or 15 g/ounce; or
- 15 ii) a hydrophobic amino acid concentration of at least 0.05, 0.06, 0.07, 0.08, 0.09, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2, 2.2, 2.4, 2.6, 2.8, 3, 3.2, 3.4, 3.6, 3.8, 4, 4.2, 4.4, 4.6, 4.8, or 5 g/ounce, and/or
- wherein the wetting agent has an HLB value of 8-9 or 2-3,
- thereby manufacturing, making, or formulating an aqueous suspension.
- 20
2. An aqueous suspension comprising:
- a plurality of amino acid entities, including at least one hydrophobic amino acid entity;
- a wetting agent; and
- 25 water,
- wherein the aqueous suspension achieves a standard for suspension uniformity, and one or both of:
- a) wherein the aqueous suspension has a volume less than or equal to 8, 7, 6, 5, 4, 3, 2, 1, or 0.5 ounces, and one or both of:
- 30 i) an overall amino acid concentration of at least 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7, 7.5, 8, 8.5, 9, 9.5, 10, 10.5, 11, 11.5, 12, 12.5, 13, 13.5, 14, 14.5, or 15 g/ounce; or

- ii) a hydrophobic amino acid concentration of at least 0.05, 0.06, 0.07, 0.08, 0.09, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2, 2.2, 2.4, 2.6, 2.8, 3, 3.2, 3.4, 3.6, 3.8, 4, 4.2, 4.4, 4.6, 4.8, or 5 g/ounce, or
- b) wherein the wetting agent has an HLB value of either 8-9 or 2-3.

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3. A method of making a dry blended preparation with improved hydrophobic amino acid dispersion, the method comprising:

providing a dry blended preparation comprising at least one hydrophobic amino acid entity and a wetting agent,

10 wherein, when the dry blended preparation is combined with water to form an aqueous suspension, the aqueous suspension achieves a standard for suspension uniformity, and

wherein one or both of:

15 a) the aqueous suspension has a volume less than or equal to 8, 7, 6, 5, 4, 3, 2, 1, or 0.5 ounces, and one or both of:

i) an overall amino acid concentration of at least 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7, 7.5, 8, 8.5, 9, 9.5, 10, 10.5, 11, 11.5, 12, 12.5, 13, 13.5, 14, 14.5, or 15 g/ounce; or

20 ii) a hydrophobic amino acid concentration of at least 0.05, 0.06, 0.07, 0.08, 0.09, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2, 2.2, 2.4, 2.6, 2.8, 3, 3.2, 3.4, 3.6, 3.8, 4, 4.2, 4.4, 4.6, 4.8, or 5 g/ounce, or

25 b) the wetting agent has an HLB value of 8-9 or 2-3, thereby making a dry blended preparation with improved hydrophobic amino acid dispersion.

4. A dry blended preparation comprising:

30 a plurality of amino acid entities, including at least one hydrophobic amino acid entity; and

a wetting agent with an HLB value of 8-9 or 2-3,

wherein, when the dry blended preparation is combined with water to form an aqueous suspension with volume less than or equal to 8, 7, 6, 5, 4, 3, 2, 1, or 0.5 ounces, and one or both of:

- i) an overall amino acid concentration of at least 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7, 7.5, 8, 8.5, 9, 9.5, 10, 10.5, 11, 11.5, 12, 12.5, 13, 13.5, 14, 14.5, or 15 g/ounce; or
- 5 ii) a hydrophobic amino acid concentration of at least 0.05, 0.06, 0.07, 0.08, 0.09, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2, 2.2, 2.4, 2.6, 2.8, 3, 3.2, 3.4, 3.6, 3.8, 4, 4.2, 4.4, 4.6, 4.8, or 5 g/ounce,
- the aqueous suspension achieves a standard for suspension uniformity
- 10 5. The method, aqueous suspension, or dry blended preparation of any of claims 1-4, wherein the wetting agent has an HLB value of 8, 9, 2, or 3.
6. The method, aqueous suspension, or dry blended preparation of any of claims 1-5, wherein the wetting agent is chosen from a lecithin or a poloxamer.
- 15 7. The method, aqueous suspension, or dry blended preparation of any of claims 1-6, wherein the wetting agent is chosen from:
- i) lecithin 40P or a substantially equivalent lecithin,
- ii) Lipoid 20S or a substantially equivalent lecithin, or
- 20 iii) poloxamer P331 or a substantially equivalent poloxamer.
8. The method, amino acid mixture, or dry blended preparation of any of claims 1-7, wherein the wetting agent is a lecithin comprising one, two, or all of:
- a) at least 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 25 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, or 45% phosphatidylcholine (PC) (and optionally less than 50, 45, or 40% phosphatidylcholine (PC));
- b) at least 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, or 45% phosphatidylinositol (and optionally less than 50, 40, 30, 20, 19, 18, 17, 16, or 15% phosphatidylinositol); and
- 30 c) at least 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, or 45% phosphatidylethanolamine (and optionally less than 50, 45, or 40% phosphatidylethanolamine).

9. The method, amino acid mixture, or dry blended preparation of any of claims 1-8, wherein the wetting agent is a lecithin comprising at least about 20 to 40% amphiphilic phospholipid (e.g., phosphatidylcholine (PC)).
- 5 10. The method, amino acid mixture, or dry blended preparation of any of claims 1-7, wherein the wetting agent is a poloxamer with:
- a) a polyoxypropylene core molecular mass of at least 2500, 2600, 2700, 2800, 2900, 3000, 3100, 3200, or 3300 g/mol (and optionally no more than 4000, 3900, 3800, 3700, 3600, 3500, 3400, or 3300 g/mol), and/or
 - 10 b) a percentage polyoxyethylene content of at least 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10% (and optionally, no more than 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, or 10%).
11. The method, amino acid mixture, or dry blended preparation of any of claims 1-7 or 10, wherein the wetting agent is a poloxamer has a polyoxypropylene core molecular mass of
- 15 about 3300 g/mol (e.g., 3300 g/mol) and a percentage polyoxyethylene content of about 10% (e.g., 10%).
12. The method, amino acid mixture, or dry blended preparation of any of claims 1-7, 10, or 11, wherein the wetting agent is a P331 poloxamer or poloxamer substantially equivalent
- 20 thereto.
13. The method, aqueous suspension, or dry blended preparation of any of claims 1-12, wherein the dry blended preparation comprises the wetting agent.
- 25 14. The method, aqueous suspension, or dry blended preparation of any of claims 1-12, wherein the dry blended preparation does not comprise the wetting agent (e.g., until during or after the combining step).
15. The method, aqueous suspension, or dry blended preparation of any of claims 1-12 or 14,
- 30 wherein the wetting agent is provided in the water used to form the aqueous suspension.
16. The method, aqueous suspension, or dry blended preparation of any of claims 1-15, wherein the aqueous suspension and/or dry blended preparation comprises one or more excipients in addition to the wetting agent.

17. The method, aqueous suspension, or dry blended preparation of any of claims 1-16, wherein the aqueous suspension and/or dry blended preparation does not comprise any additional wetting agent.

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18. The method, aqueous suspension, or dry blended preparation of any of claims 1-17, wherein the aqueous suspension has a volume of about 6, 4, 2, 1, 0.5, 0.33, 0.33-0.5, 0.5-1, 1-2, 2-4, or 4-6 ounces per dose or per dosing period.

10 19. The method, aqueous suspension, or dry blended preparation of any of claims 1-18, wherein the wetting agent, e.g., lecithin or poloxamer, is 0.5-4% (w/w) of the dry mixture or 0.1-1.5% (w/w) of the aqueous suspension.

20. The method, aqueous suspension, or dry blended preparation of any of claims 1-17, wherein the wetting agent, e.g., lecithin, is no more than 5, 4, 3, 2, 1.9, 1.8, 1.7, 1.6, 1.5, 1.4, 1.3, 1.2, or 1.1% (w/w) of the dry weight of the combination of the plurality of amino acid entities, wetting agent, and any other excipient (and optionally at least 0.5, 0.55, 0.6, 0.65, 0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 1, or 1.05%).

20 21. The method, aqueous suspension, or dry blended preparation of any of claims 1-17, wherein the wetting agent, e.g., lecithin, is about 0.5-1.5% (w/w) of the dry weight of the combination of the plurality of amino acid entities, wetting agent, and any other excipient.

22. The method, aqueous suspension, or dry blended preparation of any of claims 1-17, wherein the wetting agent, e.g., poloxamer, is at least 0.5, 0.55, 0.6, 0.65, 0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 1, 1.05, 1.1, 1.15, 1.2, 1.25, 1.3, 1.35, 1.4, 1.45, 1.5, 1.55, 1.6, 1.65, 1.7, 1.75, 1.8, 1.85, 1.9, 1.95, 2, 2.05, 2.1, 2.15, 2.2, 2.25, 2.3, 2.35, 2.4, or 2.5% (w/w) of the dry weight of the combination of the plurality of amino acid entities, wetting agent, and any other excipient (and optionally less than or equal to 5, 4, 3, 2, 1.9, 1.8, 1.7, 1.6, 1.5, 1.4, 1.3, 1.2, 1.1, 1, 0.9, 0.8, 0.7, 0.6, or 0.5% (w/w)).

23. The method, aqueous suspension, or dry blended preparation of any of claims 1-17, wherein the wetting agent, e.g., poloxamer, is no more than 5, 4, 3, 2, 1.9, 1.8, 1.7, 1.6, 1.5, 1.4, 1.3, 1.2, 1.1, 1, 0.9, 0.8, 0.7, 0.6, or 0.5% (w/w) of the dry weight of the combination of

the plurality of amino acid entities, wetting agent, and any other excipient (and optionally at least 0.5, 0.55, 0.6, 0.65, 0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 1, 1.05, 1.1, 1.15, 1.2, 1.25, 1.3, 1.35, 1.4, 1.45, 1.5, 1.55, 1.6, 1.65, 1.7, 1.75, 1.8, 1.85, 1.9, 1.95, 2, 2.05, 2.1, 2.15, 2.2, 2.25, 2.3, 2.35, 2.4, or 2.5% (w/w)).

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24. The method, aqueous suspension, or dry blended preparation of any of claims 1-17, wherein the wetting agent, e.g., poloxamer, is about 0.5-2.25% (w/w) of the dry weight of the combination of the plurality of amino acid entities, wetting agent, and any other excipient.

10 25. The method of any of claims 1 or 3-24, wherein combining comprises shaking or inverting the dry blended preparation, the wetting agent, and water (e.g., in a container, e.g., jar).

15 26. The method of claim 25, wherein shaking or inverting the dry blended preparation, the wetting agent, and water has a duration of at least 10, 20, 30, 40, 50, or 60 seconds, or 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, or 60 minutes (and optionally, no more than 120, 100, 80, 60, 40, 30, or 15 minutes, or 60, 50, 40, or 30 seconds).

20 27. The method of claim 25, wherein shaking or inverting the dry blended preparation, the wetting agent, and water continues until the aqueous suspension appears uniform, e.g., by visual inspection.

25 28. The method of claim 25, wherein shaking or inverting the dry blended preparation, the wetting agent, and water continues until the aqueous suspension achieves a standard for suspension uniformity.

29. The method of any of claims 1 or 3-28, wherein combining produces a layer of foam at the top of the aqueous suspension.

30 30. The method of claim 29, wherein combining comprises holding the aqueous suspension, e.g., after shaking or inverting or subjecting the aqueous suspension to a blending condition (e.g., to reduce the size of the layer of foam).

31. The method of claim 30, wherein holding the aqueous suspension reduces the size of the layer of foam such that the layer of foam does not interfere with downstream processing or use (e.g., imbibing) by an end user of the aqueous suspension.
- 5 32. The method of claim 30, wherein holding the aqueous suspension has a duration of less than 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, or 3 minutes, e.g., less than 10 or 5 minutes, (and optionally at least 10, 20, 30, 40, 50, or 60 seconds, or at least 1, 2, 3, 4, or 5 minutes).
- 10 33. The method of any of claims 30-32, wherein holding continues until the aqueous suspension achieves a standard for suspension uniformity.
34. The method, aqueous suspension, or dry blended preparation of any of claims 1-33, wherein the standard for suspension uniformity comprises the amount of an amino acid entity (e.g., a hydrophobic amino acid entity) at a sampling point (e.g. in weight % of total amino acid entities or weight % of the total mixture) differing from the amount of the amino acid entity (e.g., a hydrophobic amino acid entity) present in the aqueous suspension by less than a predetermined amount, e.g., less than 10, 9, 8, 7, 6, 5, 4, 3, 2, or 1%.
- 15 35. The method, aqueous suspension, or dry blended preparation of any of claims 1-33, wherein the standard for suspension uniformity comprises the amount of an amino acid entity (e.g., a hydrophobic amino acid entity) at a sampling point (e.g. in weight % of total amino acid entities or weight % of the total mixture) differing from the amount of the amino acid entity (e.g., a hydrophobic amino acid entity) present at a second sampling point by less than a predetermined amount, e.g., less than 10, 9, 8, 7, 6, 5, 4, 3, 2, or 1%.
- 20 25 36. The method of any of claims 1, 3, or 5-35, comprising acquiring a value for the amount of an amino acid entity (e.g., a hydrophobic amino acid entity) at a sampling point (e.g. in weight % of total amino acid entities or weight % of the total mixture).
- 30 37. The method of claim 36, comprising comparing the value to a reference value, e.g., the amount of the amino acid entity (e.g., a hydrophobic amino acid entity) present in the aqueous suspension.

38. The method of either of claims 36 or 37, wherein acquiring a value comprises using HPLC- UV, UPLC-UV, OPA tagged HPLC-UV, Accqtag HPLC-UV, and/or LC/MS.
39. The method, dry blended preparation, or aqueous suspension of any of claims 1-38,
5 wherein the solubilization rate of an amino acid of the aqueous suspension (e.g., a hydrophobic amino acid) is increased relative to a similar suspension not comprising the wetting agent.
40. The method, aqueous suspension, or dry blended preparation of any of claims 1-39,
10 wherein the hydrophobic amino acid entity is a branched chain amino acid (BCAA).
41. The method, aqueous suspension, or dry blended preparation of any of claims 1-40, wherein the hydrophobic amino acid entity is chosen from:
a leucine amino acid entity;
15 a valine amino acid entity;
an isoleucine amino acid entity; or
a tryptophan amino acid entity.
42. The method, aqueous suspension, or dry blended preparation of any of claims 1-41,
20 wherein the plurality of amino acid entities comprises one, two, three, or all of:
a leucine amino acid entity;
a valine amino acid entity;
an isoleucine amino acid entity; or
a tryptophan amino acid entity.
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43. The method, aqueous suspension, or dry blended preparation of any of claims 1-40, wherein the dry blended preparation comprises:
a) a leucine amino acid entity,
b) an arginine amino acid entity,
c) a glutamine amino acid entity,
d) a citrulline amino acid entity,
e) a serine amino acid entity,
f) a valine amino acid entity,
g) a histidine amino acid entity,

- h) a lysine amino acid entity,
- i) a N-acetylcysteine (NAC) amino acid entity, and
- j) a carnitine amino acid entity, and

wherein the wetting agent is lecithin, e.g., a lecithin having an HLB value of 8-9 and/or 20 to 40% amphiphilic phospholipid (e.g., phosphatidylcholine), e.g., Alcolec 40P or a substantially equivalent lecithin.

44. The method, aqueous suspension, or dry blended preparation of any of claims 1-40, wherein the dry blended preparation comprises:

- a) a leucine amino acid entity,
- b) an isoleucine amino acid entity,
- c) a valine amino acid entity,
- d) an arginine amino acid entity;
- e) a glutamine amino acid entity; and
- 5 f) an N-acetylcysteine (NAC) entity, and

wherein the wetting agent is lecithin, e.g., a lecithin having an HLB value of 8-9 and/or 20 to 40% amphiphilic phospholipid (e.g., phosphatidylcholine), e.g., Alcolec 40P or a substantially equivalent lecithin.

45. The method, aqueous suspension, or dry blended preparation of any of claims 1-40, wherein the dry blended preparation comprises:

- a) a leucine amino acid entity,
- b) an isoleucine amino acid entity,
- c) a valine amino acid entity,
- d) a histidine amino acid entity,
- e) a lysine amino acid entity,
- 10 f) a threonine amino acid entity,
- g) an ornithine amino acid entity, and
- an aspartate amino acid entity; and

wherein the wetting agent is lecithin, e.g., a lecithin having an HLB value of 8-9 and/or 20 to 40% amphiphilic phospholipid (e.g., phosphatidylcholine), e.g., Alcolec 40P or a substantially equivalent lecithin.

46. The method, aqueous suspension, or dry blended preparation of any of claims 43-45, wherein the dry blended composition further comprises one or more pharmaceutically acceptable excipients.

47. The method, aqueous suspension, or dry blended preparation of any of claims 43-45, wherein the dry blended composition further comprises an adsorbent.

5 48. A method of stabilizing N-acetylcysteine (NAC), e.g., in the presence of carnitine (CAR), the method comprising:

 forming a dry blended preparation comprising NAC and CAR, under conditions such that deacetylation of NAC in the dry blended preparation is decreased compared to the deacetylation in a reference mixture,

10 wherein the dry blended preparation comprises less than 5, 4, 3, 2, 1.9, 1.8, 1.7, 1.6, 1.5, 1.4, 1.3, 1.2, 1.1, 1, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2, or 0.1% (w/w) water, thereby stabilizing NAC.

 49. A method of making a dry blended preparation comprising N-acetylcysteine (NAC) and carnitine (CAR), the method comprising:

15 forming a dry blended preparation comprising NAC and CAR, under conditions such that deacetylation of NAC in the dry blended preparation is decreased compared to the deacetylation in a reference mixture,

 wherein the dry blended preparation comprises less than 5, 4, 3, 2, 1.9, 1.8, 1.7, 1.6, 20 1.5, 1.4, 1.3, 1.2, 1.1, 1, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2, or 0.1% (w/w) water, thereby making a dry blended preparation comprising NAC and a CAR.

50. The method of claims 48 or 49, wherein the conditions comprise one or more (e.g., all) of:

25 i) the dry blended preparation comprises an adsorbent and the deacetylation of NAC in the dry blended preparation is decreased compared to the deacetylation in a reference mixture comprising NAC and CAR in the absence of the adsorbent;

 ii) maintaining a water (e.g., free, non-adsorbed water (e.g., able to react or facilitate reaction of NAC)) concentration in the dry blended preparation of less than 2, 1.9, 1.8, 1.7, 30 1.6, 1.5, 1.4, 1.3, 1.2, 1.1, 1, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2, or 0.1% (w/w);

iii) CAR is provided in a form (e.g., crystal polymorph or alternate salt form) with reduced hygroscopicity relative to the free-base form of CAR, e.g., provided in the form of levocarnitine, carnitine HCl, or carnitine tartrate; or

iv) the dry blended preparation comprises one or more other components (e.g., amino acid entities) in a form (e.g., polymorph) with reduced hygroscopicity, e.g., relative to the free-base form of the amino acid entity.

51. The method of any of claims 48-50, wherein the dry blended preparation comprises an adsorbent.

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52. A dry blended preparation comprising:

N-acetylcysteine (NAC), carnitine (CAR) and an adsorbent (e.g., SiO₂),

wherein the dry blended preparation comprises less than 5, 4, 3, 2, 1.9, 1.8, 1.7, 1.6, 1.5, 1.4, 1.3, 1.2, 1.1, 1, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2, or 0.1% (w/w) water, and

15 wherein the adsorbent (e.g., SiO₂) is present at a weight percentage (w/w) of at least 0.05, 0.075, 0.1, 0.125, 0.15, 0.175, 0.2, 0.225, 0.25, 0.275, 0.3, 0.325, 0.35, 0.4, 0.425, 0.45, 0.475, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, or 5%, e.g., at least 0.3%, (and optionally at less than 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.5, 1, 0.9, 0.8, 0.7, 0.6, 0.575, 0.55, 0.525, 0.5, 0.475, 0.45, 0.425, 0.4, 0.375, 0.35, or 0.325%).

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53. A dry blended preparation comprising:

N-acetylcysteine (NAC) and an adsorbent (e.g., SiO₂),

wherein the dry blended preparation comprises less than 5, 4, 3, 2, 1.9, 1.8, 1.7, 1.6, 1.5, 1.4, 1.3, 1.2, 1.1, 1, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2, or 0.1% (w/w) water, and

25 wherein the adsorbent (e.g., SiO₂) is present at a weight percentage (w/w) of at least 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 7, 7.5, 8, 8.5, 9, 9.5, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, or 40% (and optionally at less than 40, 35, 30, 25, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, or 6.5%).

30 54. The method or dry blended preparation of any of claims 48-53, wherein the adsorbent is chosen from: SiO₂, magnesium silicate, calcium silicate, Talc, calcium carbonate, magnesium carbonate, MgO, calcium sulfate, CaCl₂, aluminum metal silicate, anhydrous Si acid, magnesium aluminum silicate, microcrystalline cellulose, sodium carboxymethylcellulose, calcium carboxymethylcellulose or any other appropriate adsorbent.

55. The method or dry blended preparation of any of claims 48-54, wherein the adsorbent, e.g., SiO₂, is present in the first mixture, mixture of NAC and adsorbent (e.g., SiO₂), or mixture of CAR and adsorbent (e.g., SiO₂), at a weight percentage (w/w) of at least 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 7, 7.5, 8, 8.5, 9, 9.5, or 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, or 40% (and optionally at less than 40, 35, 30, 25, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, or 6.5%).

56. The method or dry blended preparation of any of claims 48-55, wherein the adsorbent (e.g., SiO₂) is present in the dry blended preparation at a weight percentage (w/w) of less than or equal to 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.5, 1, 0.9, 0.8, 0.7, 0.6, 0.575, 0.55, 0.525, 0.5, 0.475, 0.45, 0.425, 0.4, 0.375, 0.35, or 0.325% (and optionally of at least 0.05, 0.075, 0.1, 0.125, 0.15, 0.175, 0.2, 0.225, 0.25, 0.275, 0.3, 0.325, 0.35, 0.4, 0.425, 0.45, 0.475, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, or 5%).

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57. The method or dry blended preparation of any of claims 48-56, wherein the dry blended preparation further comprises:

- a) a leucine (L)-amino acid entity;
- b) an arginine (R)-amino acid entity; and/or
- c) a glutamine (Q)-amino acid entity.

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58. The method or dry blended preparation of any of claims 48-57, wherein the dry blended preparation further comprises:

- a) a leucine (L)-amino acid entity;
- b) an arginine (R)-amino acid entity; and
- c) a glutamine (Q)-amino acid entity.

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59. The method or dry blended preparation of any of claims 48-58, wherein the dry blended preparation further comprises:

- a) a leucine (L)-amino acid entity;
- b) an arginine (R)-amino acid entity;
- c) a glutamine (Q)-amino acid entity;
- d) a citrulline amino acid entity;
- e) a serine (S)-amino acid entity;

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- f) a valine (V)-amino acid entity;
- g) a histidine (H)-amino acid entity; and
- h) a lysine (K)-amino acid entity.

5 60. The method or dry blended preparation of any of claims 48-59, wherein the dry blended preparation further comprises:

- a) a leucine (L)-amino acid entity;
- b) an arginine (R)-amino acid entity;
- c) a glutamine (Q)-amino acid entity;
- d) an isoleucine (I)-amino acid entity; and
- 10 e) a serine (S)-amino acid entity.