WHAT IS CLAIMED IS:

1. A solution of L-cysteine comprising,

a pharmaceutically acceptable carrier,

about 50 mg/mL of L-cysteine hydrochloride monohydrate, or equivalent amount of a pharmaceutically acceptable L-cysteine or a salt or hydrate thereof,

a pharmaceutically acceptable amount of cystine for at least about 12 months from the time of manufacture of the solution,

less than about 150 ppb of aluminum for at least about 12 months from the time of manufacture of the solution,

a pH from about 1.0 to about 2.5, and

wherein the solution is enclosed in a single-use vial.

2. The solution of claim 1, further comprising less than about 20 ppb fluoride.

3. The solution of claim 1, further comprising less than about 80 ppb iodide.

4. The solution of claim 3, further comprising less than about 20 ppb fluoride.

5. The solution of claim 4, wherein the pharmaceutically acceptable carrier is aqueous.

6. The solution of claim 5, wherein the container is a coated vial.

7. The solution of claim 6, wherein the vial is a silica-coated vial.

8. The solution of claim 1, further comprising lead in an amount from about 1 ppb to about 10 ppb.

9. The solution of claim 1, further comprising mercury in an amount from about 0.2 ppb to about 5.0 ppb.

10. The solution of claim 9, further comprising lead in an amount from about 1 ppb to about 10 ppb.

11. The solution of claim 10, wherein the pharmaceutically acceptable carrier is aqueous.

12. The solution of claim 11, wherein the vial is a coated vial.

13. The solution of claim 12, wherein the vial is a silica-coated vial.

14. The solution of claim 5, further comprising lead in an amount from about 1 ppb to about 10 ppb and mercury in an amount from about 0.2 ppb to about 5.0 ppb.

15. The solution of claim 1, wherein the solution is exposed to inert gas before enclosure in the single-use vial.

16. The solution of claim 1, wherein the vial has a headspace, and wherein the headspace comprises inert gas.

17. The solution of claim 1, wherein the solution is essentially free of cystine precipitates.

18. A method of preparing an L-cysteine solution comprising,

preparing a mixture of a pharmaceutically acceptable carrier comprising less than about 1 ppm dissolved oxygen and L-cysteine or a pharmaceutically acceptable salt thereof and/or hydrate thereof;

adjusting the pH of said mixture to from about 1.0 to about 2.5;

transferring an amount of the pH-adjusted mixture into a single-use container;

reducing the headspace oxygen in the container; and

sealing the container.

19. The method of claim 18, wherein the headspace oxygen is reduced by inert gas overlay.

20. The method of claim 18, wherein the headspace oxygen is reduced by vacuum operation.

21. The method of claim 18, wherein the headspace oxygen is reduced by a combination of inert gas overlay and vacuum operation.

22. The method of claim 18, wherein the headspace oxygen is reduced to about 0.5% to about 5.0% v/v.

23. The method of claim 18, wherein the container is a coated vial.

24. The method of claim 23, wherein the container is a silica-coated vial.

25. The method of claim 18, wherein at least a portion of the process is carried out at less than about 60 °C.

26. The method of claim 18, wherein at least a portion of the process is carried out at less than about 30 °C.

27. The method of claim 18, wherein the process is carried out under sterile conditions.