Claims

1. Method for preparing 2-hydroxy-4-(methylthio)butyronitrile (MMP-CN), comprising a step B, in which a gas mixture comprising hydrogen cyanide (HCN) and ammonia is brought into contact with 3-methylmercaptopropionaldehyde (MMP) and a product mixture comprising 2-hydroxy-4-(methylthio)butyronitrile (MMP-CN) is thereby obtained.

2. Method for preparing methionine or a salt of methionine, comprising a step B, in which a gas mixture comprising hydrogen cyanide (HCN) and ammonia is brought into contact with 3-methylmercaptopropionaldehyde (MMP) and a product mixture comprising 2-hydroxy-4-(methylthio)butyronitrile (MMP-CN) is thereby obtained.

3. Method according to Claim 1 or 2, in which the molar ratio of ammonia to HCN in the gas mixture is from 0.06 to 0.99.

4. Method according to any of Claims 1 to 3, further comprising step A preceding step B, in which the gas mixture essentially comprising HCN, ammonia and water is prepared according to the Andrussow process from methane, ammonia and oxygen.

5. Method according to any of Claims 1 to 3, further comprising step A preceding step B, in which the gas mixture essentially comprising HCN, ammonia and hydrogen is prepared according to the BMA process from methane and ammonia.

6. Method according to any of Claims 1 to 5, in which the product mixture obtained after step B in and/or after step B is separated into an offgas comprising nitrogen, hydrogen and/or methane, and a liquid mixture comprising MMP-CN, and the offgas is optionally further purified.

7. Method according to any of Claims 1 to 6, in which the product mixture obtained in step B further comprises 2-amino-4-(methylthio)butyronitrile (MMP-AN) and/or 2,2'-bis(2-(methylmercaptoethyl)iminodiacetonitrile (iminodinitrile).

8. Method according to any of Claims 2 to 7 further comprising a step C, in which the product mixture obtained in step B is stored at temperatures no higher than 60°C and a pH of 2 to 8, before this product mixture is further reacted.

9. Method according to any of Claims 2 to 7, further comprising a step D, in which the product mixture obtained in step B is reacted with ammonia and/or ammonium salts and carbon dioxide and/or carbonic acid salts to give 5-(2-methylmercaptoethyl)hydantoin (hydantoin).

10. Method according to Claim 9, further comprising a step E in which the hydantoin is reacted under basic conditions with formation of carbon dioxide and ammonia to give at least one methionine salt.

11. Method according to Claim 10, in which the ammonia and the carbon dioxide from step E are at least partially recycled to step D.

12. Method according to Claim 10, in which the ammonia obtained in step E is at least partially recycled to step A.

13. Method according to Claim 10, in which the ammonia obtained in step E is at least partially disposed of.

14. Method according to any of Claims 2 to 13, in which the product mixture from step B is purified by distillation by removing at least a part of the water present therein.

15. Method according to Claim 12, in which the ammonia obtained after step E is freed from sulfur-containing compounds and optionally from CO_2 before it is recycled to step A.

16. Method according to Claim 10, in which the methionine salt is reacted with an acid to give methionine.