WHAT IS CLAIMED IS:

1. A method for manufacturing an extrusion molded product comprises:
(1) a step for manufacturing a kneaded product by kneading a starting material powder, a liquid and a binder;
(2) a step for manufacturing a crushed product by crushing the kneaded product; and
(3) a step for molding the crushed product by using an extruder,
wherein, the crushed product in step (2) is crushed to a particle size such that 80 mass% or more passes through a sieve of nominal dimension (D/2) mm when the internal cylinder diameter of the extruder in step (3) is D mm.

2. A method for manufacturing an extrusion molded product comprises:
(1) a step for manufacturing a kneaded product by kneading a starting material powder, a liquid and a binder;
(2) a step for manufacturing a crushed product by crushing the kneaded product; and
(3) a step for molding the crushed product by using an extruder,
wherein the kneaded product is crushed by using a crusher in step (2).

3. The method for manufacturing an extrusion molded product according to Claim 2, wherein the total value obtained based on the maximum processing capacity of each kneading machine used in the step (1) is greater than the maximum processing capacity of the extruder used in step (3), while the total value obtained based on the maximum processing capacity of each crusher used in step (2) is greater than the maximum processing capacity of the extruder used in step (3).

4. The method for manufacturing an extrusion molded product according to Claim 2 or 3, wherein the power relative to the volume of the crusher is 10 kW/m^3~500 kW/m^3 in the step (2).

5. The method for manufacturing an extrusion molded product according to any of Claims 2~4, wherein the kneaded product is crushed in the step (2) by using a crusher selected from among a scraping type bale crusher, twin-shaft crusher, single-shaft crusher, screw-auger type crusher, and tumbling mill.

6. The method for manufacturing an extrusion molded product according to any of Claims 1~5, wherein the crushed product is molded by using a plunger extruder in the step (3).

7. The method for producing an extrusion molded product according to any of Claims 1~6, wherein the internal cylinder diameter (D) of the extruder used in the step (3) is set to be 10 mm~600 mm.

8. The method for producing an extrusion molded product according to Claim 6

or 7, wherein ratio (L/D) of the cylinder length (L) to the internal cylinder diameter (D) of the extruder used in the step (3) is set to be 1~20.

9. The method for producing an extrusion molded product according to any of Claims 1~8, wherein the starting material powder is a powdered catalyst or its precursor powder that contains at least molybdenum and phosphorus as catalytic components, and is used for producing unsaturated carboxylic acid through gas-phase catalytic oxidation of unsaturated aldehyde using molecular oxygen.

10. A method for manufacturing a catalyst for producing unsaturated carboxylic acid, comprising:

producing an extrusion molded product by the method according to Claim 9; and

applying heat on the extrusion molded product.

11. The method for manufacturing a catalyst for producing unsaturated carboxylic acid according to Claim 10, wherein unsaturated carboxylic acid is (meth)acrylic acid.

12. The method for producing an extrusion molded product according to any of Claims 1~8, wherein the starting material powder is a powdered catalyst or its precursor powder that contains at least molybdenum and bismuth as catalytic components and is used when gas-phase catalytic oxidation is carried out on propylene, isobutylene, primary butyl alcohol, tertiary butyl alcohol or methyl tert-butyl ether using molecular oxygen so as to produce their respectively corresponding unsaturated aldehyde and unsaturated carboxylic acid.

13. A method for manufacturing a catalyst for producing unsaturated aldehyde and unsaturated carboxylic acid, comprising:

producing an extrusion molding by the method according to Claim 12; and

applying heat on the extrusion molded product.

14. The method for manufacturing a catalyst for producing unsaturated aldehyde and unsaturated carboxylic acid according to Claim 13, wherein unsaturated aldehyde is (meth)acrolein, and unsaturated carboxylic acid is (meth)acrylic acid.

15. A method for producing (meth)acrylic acid, comprising:

manufacturing a catalyst for producing (meth)acrylic acid by the method according to Claim 11; and

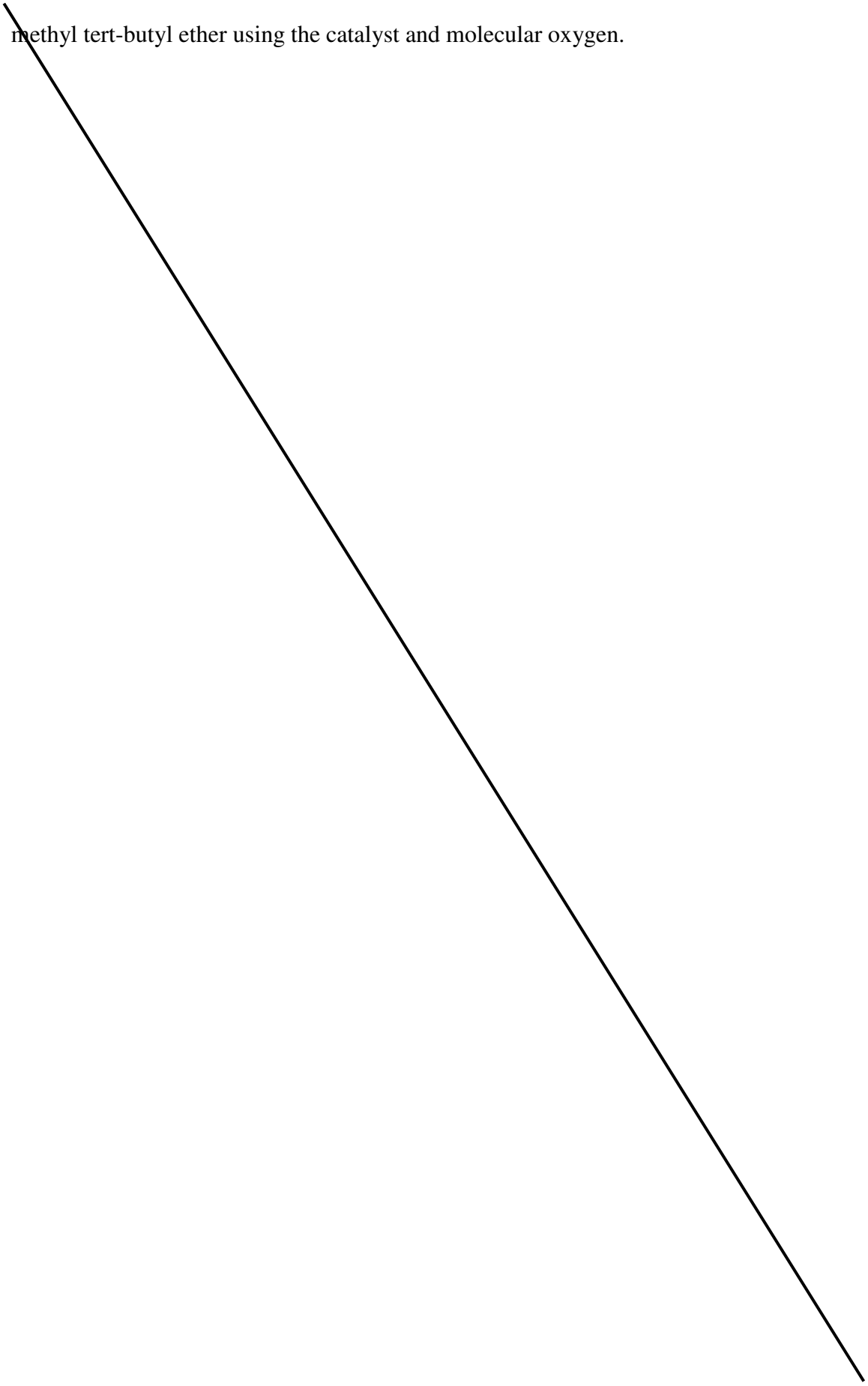
producing (meth)acrylic acid through gas-phase catalytic oxidation of (meth)acrolein using the catalyst and molecular oxygen.

16. A method for producing (meth)acrolein and (meth)acrylic acid, comprising:

manufacturing a catalyst for producing (meth)acrolein and (meth)acrylic acid by the method according to Claim 14; and

producing (meth)acrolein and (meth)acrylic acid by carrying out gas-phase catalytic oxidation of propylene, isobutylene, primary butyl alcohol, tertiary butyl alcohol or

methyl tert-butyl ether using the catalyst and molecular oxygen.



1. A method for manufacturing an extrusion molded product comprises:

(1) a step for manufacturing a kneaded product by kneading a starting material powder, a liquid and a binder;

(2) a step for manufacturing a crushed product by crushing the kneaded product; and

(3) a step for molding the crushed product by using an extruder,

wherein, the crushed product in step (2) is crushed to a particle size such that 80 mass% or more passes through a sieve of nominal dimension (D/2) mm when the internal cylinder diameter of the extruder in step (3) is D mm, and

wherein the starting material powder is a powdered catalyst or its precursor powder that contains at least molybdenum and phosphorus as catalytic components, and is used for producing unsaturated carboxylic acid through gas-phase catalytic oxidation of unsaturated aldehyde using molecular oxygen.

2. A method for manufacturing an extrusion molded product comprises:

(1) a step for manufacturing a kneaded product by kneading a starting material powder, a liquid and a binder;

(2) a step for manufacturing a crushed product by crushing the kneaded product; and

(3) a step for molding the crushed product by using an extruder,

wherein the kneaded product is crushed by using a crusher in step (2), and

wherein the starting material powder is a powdered catalyst or its precursor powder that contains at least molybdenum and phosphorus as catalytic components, and is used for producing unsaturated carboxylic acid through gas-phase catalytic oxidation of unsaturated aldehyde using molecular oxygen.

3. The method for manufacturing an extrusion molded product according to Claim 2, wherein the total value obtained based on the maximum processing capacity of each kneading machine used in the step (1) is greater than the maximum processing capacity of the extruder used in step (3), while the total value obtained based on the maximum processing capacity of each crusher used in step (2) is greater than the maximum processing capacity of the extruder used in step (3).

4. The method for manufacturing an extrusion molded product according to Claim 2 or 3, wherein the power relative to the volume of the crusher is 10 kW/m^3~500 kW/m^3 in the step (2).

5. The method for manufacturing an extrusion molded product according to any of Claims 2~4, wherein the kneaded product is crushed in the step (2) by using a crusher selected from among a scraping type bale crusher, twin-shaft crusher, single-shaft crusher, screw-auger type crusher, and tumbling mill.

6. The method for manufacturing an extrusion molded product according to any of Claims 1~5, wherein the crushed product is molded by using a plunger extruder in the step (3).

7. The method for producing an extrusion molded product according to any of Claims 1~6, wherein the internal cylinder diameter (D) of the extruder used in the step (3) is set to be 10 mm~600 mm.

8. The method for producing an extrusion molded product according to Claim 6 or 7, wherein ratio (L/D) of the cylinder length (L) to the internal cylinder diameter (D) of the extruder used in the step (3) is set to be 1~20.

9. A method for manufacturing a catalyst for producing unsaturated carboxylic acid, comprising:

producing an extrusion molded product by the method according to any of Claims 1 to 8 ; and

applying heat on the extrusion molded product.

10. The method for manufacturing a catalyst for producing unsaturated carboxylic acid according to Claim 9, wherein unsaturated carboxylic acid is (meth)acrylic acid.

11. A method for manufacturing an extrusion molded product comprises:

(1) a step for manufacturing a kneaded product by kneading a starting material powder, a liquid and a binder;

(2) a step for manufacturing a crushed product by crushing the kneaded product; and

(3) a step for molding the crushed product by using an extruder,

wherein, the crushed product in step (2) is crushed to a particle size such that 80 mass% or more passes through a sieve of nominal dimension (D/2) mm when the internal cylinder diameter of the extruder in step (3) is D mm, and

wherein the starting material powder is a powdered catalyst or its precursor powder that contains at least molybdenum and bismuth as catalytic components and is used when gas-phase catalytic oxidation is carried out on propylene, isobutylene, primary butyl alcohol, tertiary butyl alcohol or methyl tert-butyl ether using molecular oxygen so as to produce their respectively corresponding unsaturated aldehyde and unsaturated carboxylic acid.

12. A method for manufacturing an extrusion molded product comprises:

(1) a step for manufacturing a kneaded product by kneading a starting material powder, a liquid and a binder;

(2) a step for manufacturing a crushed product by crushing the kneaded product; and

(3) a step for molding the crushed product by using an extruder,

wherein the kneaded product is crushed by using a crusher in step (2), and

wherein the starting material powder is a powdered catalyst or its precursor powder that contains at least molybdenum and bismuth as catalytic components and is used when gas-phase catalytic oxidation is carried out on propylene, isobutylene, primary butyl alcohol, tertiary butyl alcohol or methyl tert-butyl ether using molecular oxygen

so as to produce their respectively corresponding unsaturated aldehyde and unsaturated carboxylic acid.

13. The method for manufacturing an extrusion molded product according to Claim 12, wherein the total value obtained based on the maximum processing capacity of each kneading machine used in the step (1) is greater than the maximum processing capacity of the extruder used in step (3), while the total value obtained based on the maximum processing capacity of each crusher used in step (2) is greater than the maximum processing capacity of the extruder used in step (3).

14. The method for manufacturing an extrusion molded product according to Claim 12 or 13, wherein the power relative to the volume of the crusher is 10 kW/m^3~500 kW/m^3 in the step (2).

15. The method for manufacturing an extrusion molded product according to any of Claims 12 ~ 14, wherein the kneaded product is crushed in the step (2) by using a crusher selected from among a scraping type bale crusher, twin-shaft crusher, single-shaft crusher, screw-auger type crusher, and tumbling mill.

16. The method for manufacturing an extrusion molded product according to any of Claims 11 ~ 15, wherein the crushed product is molded by using a plunger extruder in the step (3).

17. The method for producing an extrusion molded product according to any of Claims 11 ~ 16, wherein the internal cylinder diameter (D) of the extruder used in the step (3) is set to be 10 mm~600 mm.

18. The method for producing an extrusion molded product according to Claim 16 or 17, wherein ratio (L/D) of the cylinder length (L) to the internal cylinder diameter (D) of the extruder used in the step (3) is set to be 1~20.

19. A method for manufacturing a catalyst for producing unsaturated aldehyde and unsaturated carboxylic acid, comprising:

producing an extrusion molding by the method according to any of Claims 11 - 18; and

applying heat on the extrusion molded product.

20. The method for manufacturing a catalyst for producing unsaturated aldehyde and unsaturated carboxylic acid according to Claim 19, wherein unsaturated aldehyde is (meth)acrolein, and unsaturated carboxylic acid is (meth)acrylic acid.

21. A method for producing (meth)acrylic acid, comprising:

manufacturing a catalyst for producing (meth)acrylic acid by the method according to Claim 10; and

producing (meth)acrylic acid through gas-phase catalytic oxidation of

(meth)acrolein using the catalyst and molecular oxygen.

22. A method for producing (meth)acrolein and (meth)acrylic acid, comprising:

manufacturing a catalyst for producing (meth)acrolein and (meth)acrylic acid by the method according to Claim 20; and

producing (meth)acrolein and (meth)acrylic acid by carrying out gas-phase catalytic oxidation of propylene, isobutylene, primary butyl alcohol, tertiary butyl alcohol or methyl tert-butyl ether using the catalyst and molecular oxygen.