CLAIMS

1. A water-soluble metalworking fluid comprising:

a component (A);

a component (B);

a component (C);

a component (D); and

at least one of an acidic phosphate ester and a phosphite ester, wherein

the component (A) is a carboxylic acid having 8 to 18 carbon atoms;

the component (B) is a trialkanolamine;

the component (C) is a water soluble polymer having a mass average molecular weight of 200 or more; and

the component (D) is water.

2. The water-soluble metalworking fluid according to Claim 1, wherein a mixed amount of each of the components in a total amount of the water-soluble metalworking fluid is as follows:

the component (A) is in a range of 20 mass% to 40 mass%;

the component (B) is in a range of 20 mass% to 40 mass%;

the component (C) is in a range of 1 mass% to 15 mass%; and

the component (D) is in a range of 10 mass% to 80 mass%.

3. The water-based metalworking fluid according to Claim 1 or 2, wherein the component (C) is a nonionic surfactant.

4. The water-soluble metalworking fluid according to Claim 3, wherein the nonionic surfactant has a polyalkylene glycol structure.

5. The water-based metalworking fluid according to any one of Claims 1 to 4, further comprising: a metal deactivator.

6. The water-based metalworking fluid according to any one of Claims 1 to 5, wherein the

water-based metalworking fluid comprises the component (A), the component (B), the component (C), the component (D) and the acidic phosphate.

7. The water-based metalworking fluid according to any one of Claims 1 to 6, wherein the water-based metalworking fluid comprises the component (A), the component (B), the component (C), the component (D), the acidic phosphate and the phosphite ester.

8. A metalworking fluid provided by diluting the water-based metalworking fluid according to any one of Claims 1 to 7 with water a volume of which is 2 to 200 times as much as that of the water-based metalworking fluid.

9. The metalworking fluid according to Claim 8, wherein the metalworking fluid is used for processing aluminum.

CLAIMS

1. A water-soluble metalworking fluid comprising the following components (A), (B), (C) and (D) and at least one of acidic phosphate ester and phosphite ester:

(A) a carboxylic acid having 8 to 12 carbon atoms;

(B) a trialkanolamine;

(C) a water soluble polymer having a mass average molecular weight of 200 or more; and

(D) water, wherein

the component (C) is a compound represented by the following formula (1),

R^1-[$(OR^2)_{m1}$-OR^3]$_{n1}$ (1)

where R^1 represents any one of a hydrogen atom, hydrocarbyl group having 1 to 10 carbon atoms, oxygen-containing hydrocarbyl group having 2 to 10 carbon atoms, acyl group having 2 to 10 carbon atoms and hydrocarbyl group having 2 to 6 bonding sites and 1 to 10 carbon atoms, R^2 represents an alkylene group having 2 to 4 carbon atoms, R^3 represents any one of a hydrogen atom, hydrocarbyl group having 1 to 10 carbon atoms, oxygen-containing hydrocarbyl group having 2 to 10 carbon atoms and acyl group having 2 to 10 carbon atoms, n1 represents an integer of 1 to 6, and m1 represents a number determined so that an average value of m1×n1 is in a range of 6 to 80, and

a mixed amount of each of the components (A), (B) and (C) in a total amount of the water-soluble metalworking fluid is as follows:

the component (A): in a range of 20 mass% to 40 mass%;

the component (B): in a range of 20 mass% to 40 mass%; and

the component (C): in a range of 1 mass% to 15 mass%.

2. The water-soluble metalworking fluid according to Claim 1, further comprising a metal deactivator.

3. The water-soluble metalworking fluid according to Claim 1 or 2, wherein

the water-soluble metalworking fluid comprises the component (A), the component (B), the component (C), the component (D) and the acidic phosphate ester.

4. A water-soluble metalworking fluid comprising the following components (A), (B), (C) and (D), acidic phosphate ester and phosphite ester:

(A) a carboxylic acid having 8 to 12 carbon atoms;

(B) a trialkanolamine;

(C) a water soluble polymer having a mass average molecular weight of 200 or more; and

(D) water.

5. A metalworking fluid provided by diluting the water-soluble metalworking fluid according to any one of Claims 1 to 4 with water, a volume of which is 2 to 200 times as much as that of the water-soluble metalworking fluid.

6. The metalworking fluid according to Claim 6, wherein the metalworking fluid is used for processing aluminum.