WHAT IS CLAIMED IS:

1. A heat transfer mixture comprising a nanofluid, the nanofluid consisting of propylene glycol, water, a nanopowder, a surfactant and a base additive, the heat transfer mixture being representative by the formula:

$$1 = Vpg/Vnf + Vw/Vnf + Vpw/Vnf + Vsf/Vnf + Vbs/Vnf,$$

wherein Vnf is a volume of the nanofluid,

wherein Vpg is a volume of the propylene glycol,

wherein Vw is a volume of the water,

wherein Vpw is a volume of the nanopowder,

wherein Vsf is a volume of the surfactant,

wherein Vbs is a volume of the base additive, and

wherein the nanopowder consists of aluminum oxide having a particle size between 100 nanometers and 600 nanometers.

2. The heat transfer mixture recited in claim 1, wherein

$5\% < Vpg/Vnf < 75\%$,

$15\% < Vw/Vnf < 90\%$,

$0.1\% < Vpw/Vnf < 20\%$,

$0.1\% < Vsf/Vnf < 3\%$, or

$0.1\% < Vbs/Vnf < 10\%$.

3. The heat transfer mixture recited in claim 1, wherein:

$5\% < Vpg/Vnf < 75\%$;

$15\% < Vw/Vnf < 90\%$;

$0.1\% < Vpw/Vnf < 20\%$;

$0.1\% < Vsf/Vnf < 3\%$; and

$0.1\% < Vbs/Vnf < 10\%$.

4. A heat transfer mixture comprising:

propylene glycol;

water;

a nanopowder consisting of Al_2O_3 having a particle size between 100 nanometers and 600 nanometers;

a surfactant; and

a base additive,

wherein the heat transfer mixture comprises between 1% by volume and 20% by volume of the nanopowder,

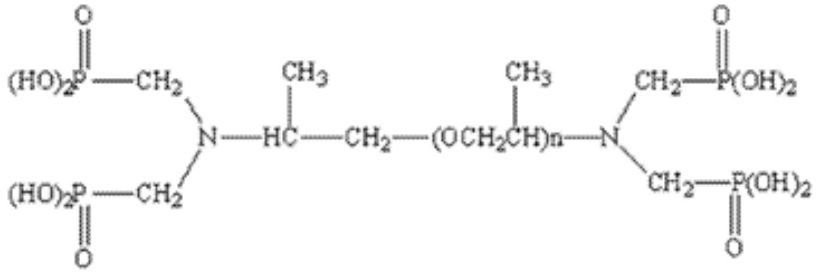
wherein the heat transfer mixture comprises between 0.1% by volume and 3% by volume of the surfactant, and

wherein the heat transfer mixture has a pH is between 8.5 to 12.

5. The heat transfer mixture recited in claim 4,

wherein the surfactant is a sodium salt solution of polyamino polyether methylene phosphonic acid, or

wherein the surfactant is represented by the formula:



6. A heat transfer mixture comprising:

between 5% by volume and 70% by volume of propylene glycol;

between 15% by volume and 90% by volume of water;

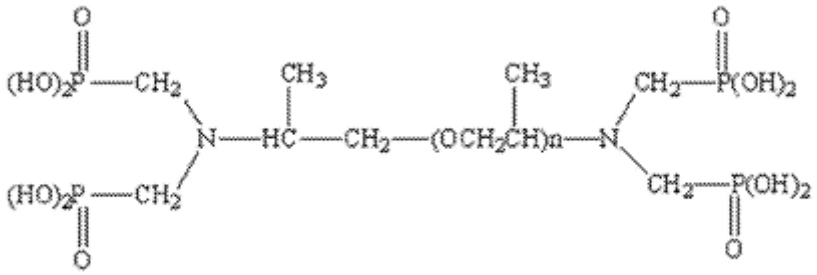
between 1.0% by volume and 20% by volume of a nanopowder consisting of Al_2O_3 having a particle size between 100 nanometers and 600 nanometers;

between 0.1% by volume and 3% by volume of a surfactant; and

between 1.0% by volume and 10% by volume of a base additive,

wherein the heat transfer mixture has a pH of about 10.0.

7. The heat transfer mixture recited in claim 6, wherein the surfactant is represented by the formula:



8. A heat transfer mixture comprising a nanofluid, the nanofluid consisting of ethylene glycol, water, a nanopowder, a surfactant, a base additive, an acid additive and a corrosive inhibitor, the heat transfer mixture being representative by the formula:

1 = Veg/Vnf + Vw/Vnf + Vpw/Vnf + Vsf/Vnf + Vbs/Vnf + Vac/Vnf + Vci/Vnf,
wherein Vnf is a volume of the nanofluid,
wherein Veg is a volume of the ethylene glycol,
wherein Vw is a volume of the water,
wherein Vpw is a volume of the nanopowder,
wherein Vsf is a volume of the surfactant,
wherein Vbs is a volume of the base additive,
wherein Vac is a volume of the acid additive,
wherein Vci is a volume of the corrosive inhibitor, and
wherein the nanopowder consists of aluminum oxide having a particle size between 100 nanometers and 600 nanometers.

9. The heat transfer mixture recited in claim 8,
wherein 25.0% ⟨ Veg/Vnf ⟨ 50.0%,
wherein 30.0% ⟨ Vw/Vnf ⟨ 70.0%,
wherein 1 % ⟨ Vpw/Vnf ⟨3.0%,
wherein 0.12% ⟨ Vsf/Vnf ⟨ 0.40%,
wherein 1.3% ⟨ Vbs/Vnf ⟨ 2.0%,
wherein 0.0 % ⟨ Vac/Vnf ⟨ 2.0%, or
wherein 0.012% ⟨ Vci/Vnf ⟨ 0.1%.

10. The heat transfer mixture recited in claim 8, wherein:
25.0%⟨ Veg/Vnf ⟨50.0%;
30.0%⟨ Vw/Vnf ⟨70.0%;

1.0%⟨ Vpw/Vnf ⟨3.0%;

0.12%⟨ Vsf/Vnf ⟨0.40%;

1.3%⟨ Vbs/Vnf ⟨2.0%;

0.0%⟨ Vac/Vnf ⟨2.08%; and

0.02%⟨ Vci/Vnf ⟨0.1%.

11. The heat transfer mixture recited in claim 8, wherein:

30.0%⟨ Veg/Vnf ⟨45.0%;

50.0%⟨ Vw/Vnf ⟨65.0%;

1%⟨ Vpw/Vnf ⟨2.0%;

0.12%⟨ Vsf/Vnf ⟨0.40%;

1.3%⟨ Vbs/Vnf ⟨6.8%;

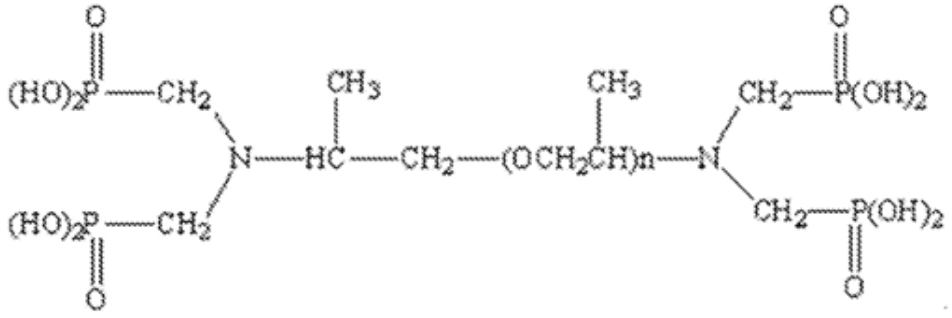
0⟨ Vac/Vnf ⟨2.0%; and

0.02⟨ Vci/Vnf ⟨0.1%.

12. The heat transfer mixture recited in claim 8,

wherein the surfactant is a sodium salt solution of polyamino polyether methylene phosphonic acid,

wherein the surfactant is represented by the formula:



,

wherein the heat transfer mixture has a pH of between 8.5-12.0, or

wherein the heat transfer mixture has a pH of 10.0.

13. A heat transfer mixture comprising:

ethylene glycol;

water;

a nanopowder consisting of Al_2O_3 having a particle size between 100 nanometers and 600 nanometers;

a surfactant;

a base additive;

an acid additive; and

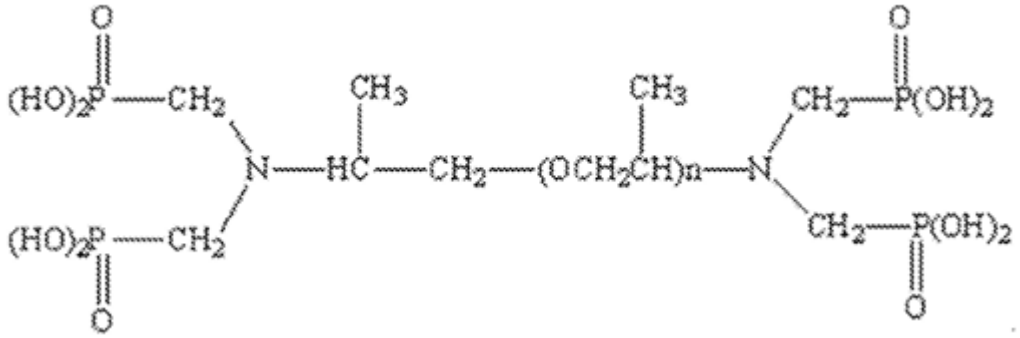
a corrosive inhibitor,

wherein the heat transfer mixture comprises between 10% by volume and 20% by volume of the nanopowder,

wherein the heat transfer mixture comprises between 0.4% by volume and 3% by volume of the surfactant, and

wherein the heat transfer mixture has a pH is between 8.5 to 12.0

14. The heat transfer mixture recited in claim 13, wherein the surfactant is a sodium salt solution of polyamino-polyether-methylene-phosphonic acid, or wherein the surfactant is represented by the formula:



15. A heat transfer mixture comprising:

between 5% by volume and 70% by volume of ethylene glycol;

between 15% by volume and 90% by volume of water;

between 1.0% by volume and 20% by volume of a nanopowder consisting of Al_2O_3 having a particle size between 100 nanometers and 600 nanometers;

between 0.1% by volume and 3% by volume of a surfactant;

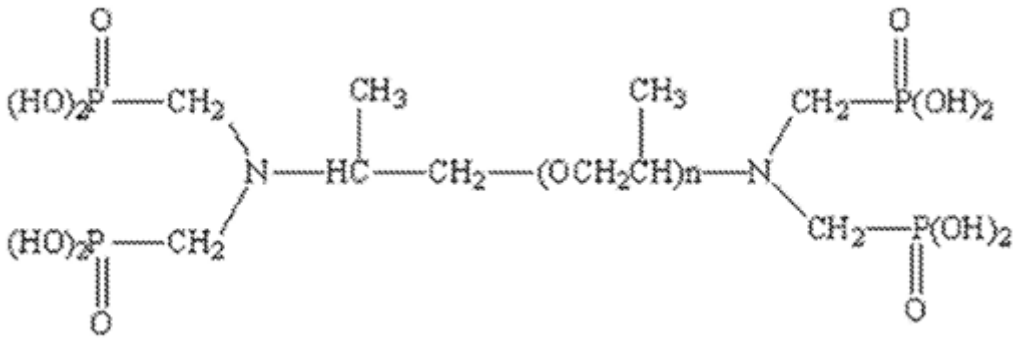
between 1.0% by volume and 10% by volume of a base additive;

between 0% by volume and 6.8% by volume of an acid additive; and

between 0.12% by volume and 0.10% by volume of a corrosive inhibitor,

wherein the heat transfer mixture has a pH of about 10.0.

16. The heat transfer mixture recited in claim 15, wherein the surfactant is represented by the formula:



17. A heat transfer mixture comprising a nanofluid, the nanofluid consisting of ethylene glycol, water, a nanopowder, a surfactant and an acid additive, the heat transfer mixture being representative by the formula:

$1 = Veg/Vnf + Vw/Vnf + Vpw/Vnf + Vsf/Vnf + Vac/Vnf$

wherein Vnf is a volume of the nanofluid,

wherein Veg is a volume of the ethylene glycol,

wherein Vw is a volume of the water,

wherein Vpw is a volume of the nanopowder,

wherein Vsf is a volume of the surfactant,

wherein Vac is a volume of the acid additive, and

wherein the nanopowder consists of aluminum oxide having a particle size between 100 nanometers and 600 nanometers.

18. The heat transfer mixture recited in claim 17,

wherein $25\% < Veg/Vnf < 50\%$,

wherein $30\% < Vw/Vnf < 70\%$,

wherein $0.1\% < Vpw/Vnf < 20\%$,

wherein $0.1\% < Vsf/Vnf < 3\%$, or

wherein $0\% < Vac/Vnf < 10\%$.

19. The heat transfer mixture recited in claim 17, wherein:

$25\% < Veg/Vnf < 50\%$;

$30\% < Vw/Vnf < 70\%$;

$0.1\% < Vpw/Vnf < 30\%$;

$0.1\% < Vsf/Vnf < 5\%$; and

$0\% < Vac/Vnf < 10\%$.

20. A heat transfer mixture comprising:

ethylene glycol;

water;

a nanopowder consisting of Al_2O_3 having a particle size between 100 nanometers and 600 nanometers;

a surfactant; and an acid additive,

wherein the heat transfer mixture comprises between 10% by volume and 20% by volume of the nanopowder,

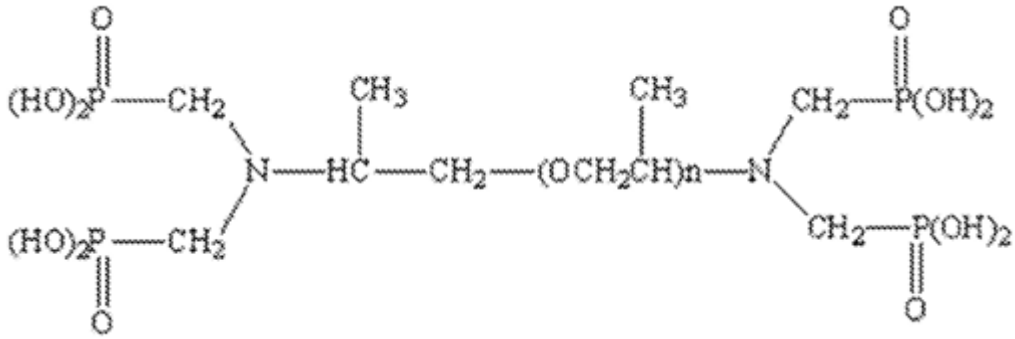
wherein the heat transfer mixture comprises between 0.1% by volume and 3% by volume of the surfactant, and

wherein the heat transfer mixture has a pH of 8.5 to 12.0.

21. The heat transfer mixture recited in claim 20,

wherein the surfactant is a sodium salt solution of polyamino polyether methylene phosphonic acid, or

wherein the surfactant is represented by the formula:



22. A heat transfer mixture comprising:

between 25% by volume and 50% by volume of ethylene glycol;

between 30% by volume and 70% by volume of water;

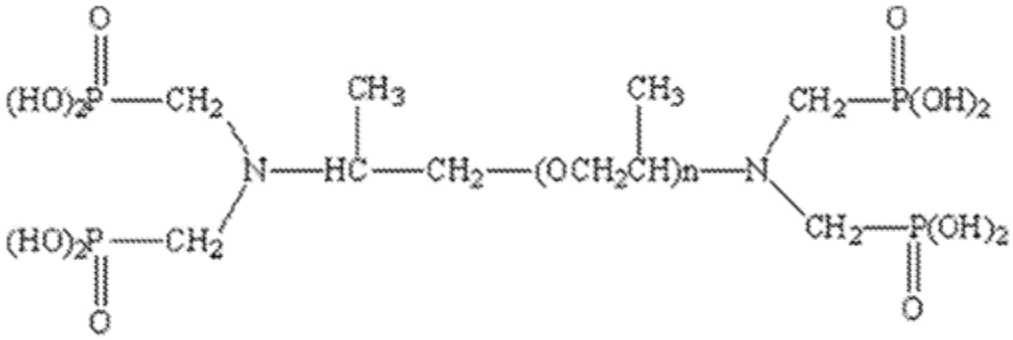
between 1.0% by volume and 3.0% by volume of a nanopowder consisting of Al_2O_3 having a particle size of between 100 nanometers and 600 nanometers;

between 0.1% by volume and 0.4% by volume of a surfactant; and

between 0% by volume and 2.0% by volume of an acid additive,

wherein the heat transfer mixture has a pH of about 10.0.

23. The heat transfer mixture recited in claim 22, wherein the surfactant is represented by the formula:



24. A heat transfer mixture comprising a nanofluid, the nanofluid consisting of water, a nanopowder, a surfactant, a base additive, an acid additive, and a corrosive inhibitor, the heat transfer mixture being representative by the formula:

1 = Vw/Vnf + Vpw/Vnf + Vsf/Vnf + Vbs/Vnf + Vac/Vnf + Vci/Vnf,
wherein Vnf is a volume of the nanofluid,
wherein Vw is a volume of the water,
wherein Vpw is a volume of the nanopowder,
wherein Vsf is a volume of the surfactant,
wherein Vbs is a volume of the base additive,
wherein Vac is a volume of the acid additive,
wherein Vci is a volume of the corrosive inhibitor, and
wherein the nanopowder consists of aluminum oxide having a particle size between 100 nanometers and 600 nanometers,

25. The heat transfer mixture recited in claim 24, wherein the surfactant is HEDP / PBTC / PCA - etidronic acid / phosphonobutane-tricarboxylic acid / phosphino-carboxylic acid.