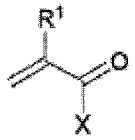
CLAIMS

We claim:

1. A composition comprising a polymer derived from at least two monomers: acrylic-x and an alkylamine, wherein said acrylic-x has the following formula:



wherein X = OR and wherein R is an alkyl or aryl group,

wherein R^1 is H or an alkyl or an aryl group, and wherein the molecular weight of said polymer is between 500 to 200,000,

and wherein said polymer is modified to comprise at least one dithiocarbamic acid or salts thereof that is capable of scavenging one or more compositions containing one or more metals.

2. The composition of claim 1, wherein the modified polymer comprises a dithiocarbamate salt group.

3. The composition of claim 2, wherein said dithiocarbamate salt group is present in the range of 35 to 40 weight % of said polymer.

4. The composition of claim 1, wherein said alkylamine is at least one of the following: an ethyleneamine, a polyethylenepolyamine, a polyethyleneimine, ethylenediamine (EDA), diethylenetriamine (DETA), triethylenetetraamine (TETA), tetraethylenepetamine (TEPA), and pentaethylenehexamine (PEHA).

5. The composition of claim 1, wherein acrylic-x is at least one of the following: methyl acrylate, methyl methacrylate, ethyl acrylate, ethyl methacrylate, propyl acrylate, and propyl methacrylate.

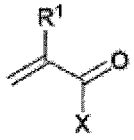
6. The composition of claim 1, wherein the acrylic-x is an acrylic ester and the alkylamine is PEHA or TEPA or DETA or TETA or EDA, and wherein the molar ratio between acrylic-x and alkylamine is from 0.85 to 1.5.

7. The composition of claim 6, wherein the molecular weight of said polymer is from 1,500 to 8,000 and wherein the polymer is modified to contain more than 55 mole percent dithiocarbamic acid or salts thereof.

CLAIMS

We claim:

81. A composition comprising a polymer derived from a condensation polymerization reaction of at least two monomers: acrylic-x and an alkylamine, wherein said acrylic-x has the following formula:



wherein X = OH and salts thereof or NHR^2 and wherein R^1 and R^2 is H or an alkyl or aryl group, ~~wherein R is an alkyl or aryl group,~~ wherein the molecular weight of said polymer is between 500 to 200,000, and wherein said polymer is modified to comprise at least one dithiocarbamic acid or salts thereof that is capable of scavenging one or more compositions containing one or more heavy metals.

92. The composition of claim 81, wherein the modified polymer comprises a dithiocarbamate salt group.

103. The composition of claim 82, wherein said dithiocarbamate salt group is present in the range of between 5 to 100 mole ~~35 to 40 weight~~ % of said polymer.

114. The composition of claim 81, wherein said alklyamine is at least one of the following: an ethyleneamine; a polyethylenepolyamine; a polyethyleneimine; ethylenediamine (EDA);, diethylenetriamine (DETA);, triethylenetetraamine (TETA); ~~and tetraethylenepetamine~~tetraethylenepentamine (TEPA); and pentaethylenehexamine (PEHA).

125. The composition of claim 84, wherein the acrylic-x is acrylic acid or salts thereof and the alkylamine is PEHA or TEPA or DETA or TETA or EDA, and wherein the molar ratio between acrylic-x and alkylamine is from 0.85 to 1.5.

6. The composition of claim 1, wherein the acrylic-x is at least one of the following: acrylic acid and salts thereof, methacrylic acid and salts thereof, acrylamide, and methacrylamide.

137. The composition of ~~claim 12~~any one of claims 1-6, wherein the molecular weight of said polymer is from 1 ,500 to 8,000 and wherein the polymer is modified to contain more than 55 mole percent dithiocarbamic acid or salts thereof.

8. The composition of any one of claims 1–7, further comprising at least one metal selected from the group consisting of: copper, nickel, zinc, lead, mercury, cadmium, silver, iron, manganese, palladium, platinum, strontium, arsenic, cobalt, and gold.

9. The composition of any one of claims 1–7, further comprising mercury.

10. The composition of any one of claims 1–7, further comprising lead.

11. The composition of any one of claims 1–7, further comprising cadmium.

12. The composition of any one of claims 1–7, further comprising manganese.

~~14. The composition of claim 8, wherein the acrylic-X is acrylamide and the alkylamine is PEHA or TEPA or DETA or TETA or EDA, and wherein the molar ratio between acrylic-x and alkylamine is from 0.85 to 1.5.~~

~~15. The composition of claim 14, wherein the molecular weight of said polymer is 1,500 to 8,000 and wherein the polymer is modified to contain more than 55 mole percent dithiocarbamic acid or salts thereof.~~