Claims

[Claim 1] A process of preparing a polyurea microcapsule comprising:

mixing a surfactant and a cross-linking agent to make a first mixture;

adding an active ingredient and an isocyanate compound to a solvent to make a second mixture;

combining the first mixture with the second mixture to make a third mixture;

emulsifying the third mixture;

curing the emulsified third mixture;

filtering the cured third mixture; and

drying the filtered third mixture.

[Claim 2] The process according to claim 1, wherein the process further comprises dispersing the dried third mixture in water to make a fourth mixture.

[Claim 3] The process according to claim 2, wherein the process further comprises adding a viscosity modifier to the fourth mixture to make a fifth mixture.

[Claim 4] The process according to any one of claims 1 to 3, wherein the surfactant comprises poly(sodium 4-styrenesulfonate), anionic surfactant having a weight average molecular weight of 70,000 or more and 1,000,000 or less.

[Claim 5] The process according to any one of claims 1 to 4, wherein the cross-linking agent comprises:

a salt of guanidine;

alkali metal oxide or alkaline earth metal oxide; or

polyamine cross-linking agent including one or more NH_2 group per molecule.

[Claim 6] The process according to claim 5, wherein

the guanidine is selected from a group consisting of guanidine carbonate, guanidine hydrochloride, guanidine nitrate, guanidine sulfate, guanidine acetate, and guanidine phosphate,

the alkali metal is selected from a group consisting of sodium and potassium,

the alkaline earth metal oxide is selected from a group consisting of calcium and cerium, and the polyamine cross-linking agent is selected from a group consisting of tris (2aminoethyl) amine, tri ethylene tetra amine, tetra ethylene pentamine, and pentaethylene hexamine.

[Claim 7] The process according to any one of claims 1 to 6, wherein the active ingredient comprises para-menthane-3, 8-diol, eucalyptus oil, citronella oil, geraniol oil, lemongrass oil, neem, basil oil, camphor oil, cinnamon oil, clove oil, castor oil, etofenprox, diiodomethyl-p-tolylsulfone, 3-Iodo-2-propynyl N-butylcarbamate, or combinations thereof.

[Claim 8] The process according to any one of claims 1 to 7, wherein the solvent comprises glyceryl tributyrate, caprylic triglyceride, capric triglyceride, diethyl phthalate, dimethyl phthalate, methyl cocoate, methyl cocoate, or combinations thereof.

[Claim 9] The process according to any one of claims 1 to 8, wherein the isocyanate compound comprises aromatic polyisocyanate, aliphatic polyisocyanate, or derivatives of aromatic polyisocyanate or aliphatic polyisocyanate having free isocyanate group and containing adduct, trimer, biuret, or combinations thereof.

[Claim 10] The process according to claim 9, wherein the aliphatic polyisocyanate comprises xylylene diisocyanate, hexamethylene diisocyanate, isophorone diisocyanate, or combinations thereof; and the aromatic polyisocyanate comprises toluene diisocyanate, diphenylmethane diisocyanate, or combinations thereof.

[Claim 11] The process according to claim 3, wherein the viscosity modifier comprises xanthan gum, gum arabic, karaya gum, clays, starch polymer, colloidal polymer or combinations thereof.

[Claim 12] A process of manufacturing a mosquito repellant, the process comprising:

mixing a surfactant and a cross-linking agent to make a first mixture;

adding an active ingredient and an isocyanate compound to a solvent to make a second mixture;

combining the first mixture with the second mixture to make a third mixture;

emulsifying the third mixture;

curing the emulsified third mixture;

filtering the cured third mixture;

drying the filtered third mixture; and

mixing the dried third mixture with water and a starch to make the mosquito repellant.

[Claim 13] A process of repelling mosquito, the process comprising:

applying the mosquito repellant manufactured by the process according to claim 12 to a fabric; and

covering a skin to be protected by the fabric.