Claims

1. ~~Process for the preparation~~ Production process of liquid tin(II) alkoxides consists of the use of amine base or amine ligand in 2–3 mole equivalence of anhydrous tin(II) chloride in nonpolar, aprotic solvents to react with anhydrous tin(II) chloride under inert atmosphere. ~~–~~The solvent ~~surrounds~~ will surround the newly ~~formed~~ produced tin(II) alkoxide molecules from the reaction and ~~thus~~ prevents ~~their~~ the unwanted self-aggregation ~~and also~~ of tin(II) alkoxide as same as the possible multi-aggregation between ~~the~~ bridging alcohol and tin(II) alkoxide molecules when excess anhydrous alcohol is used, typically in 2-3 mole equivalence of ~~the~~ anhydrous tin(II) chloride. The mixture is thoroughly stirred for 12 hours in the temperature range of 25 – 38 ℃ to afford liquid tin(II) alkoxides which were viscous, yellow liquids. Novel liquid tin(II) alkoxides show high solubility in common organic solvent. The general formula for these new tin(II) alkoxides is $Sn(OnR)_2$ where the R group = CH_3, C_2H_5, nC_3H_7, nC_4H_9, nC_5H_{11}, nC_6H_{13}, nC_7H_{15}, and nC_8H_{17}.
2. ~~Process for the preparation~~ Production process of liquid tin(II) alkoxides, as described in Claim 1, can use ~~a~~ amine base or amine ligand from ~~any~~ the choices of: dimethylamine, diethylamine, diisopropylamine, trimethylamine, and triethylamine.
3. ~~Process for the preparation~~ Production process of liquid tin(II) alkoxides, as described in Claim 1, shows that the most suitable amine base or amine ligand is diethylamine.
4. ~~Process for the preparation~~ Production process of liquid tin(II) alkoxides, as described in Claim 1, can use a nonpolar, aprotic solvent from ~~any~~ the choices of: *n*-heptane, *n*-hexane, cyclohexane, benzene, toluene, xylene, and tetrahydrofuran.
5. ~~Process for the preparation~~ Production process of liquid tin(II) alkoxides, as described in Claim 1, shows that the most suitable nonpolar, aprotic solvent is *n*-heptane.
6. ~~Process for the preparation~~ Production process of liquid tin(II) alkoxides, as described in Claim 1, also includes the following appropriate steps as following discussed:
    a. Anhydrous tin(II) chloride is dissolved in dry *n*-heptane under ~~a~~ nitrogen or argon atmosphere.
    b. Dry diethylamine is added into the reaction mixture of anhydrous tin(II) chloride in dry *n*-heptane.
    c. The mixture is well-stirred under ~~a~~ nitrogen or argon atmosphere.
    d. Alcohol (ROH), where R = CH_3, C_2H_5, *n*-C_3H_7, *n*-C_4H_9, *n*-C_5H_{11}, *n*-C_6H_{13}, *n*-C_7H_{15}, and *n*-C_8H_{17}, is added to the reaction mixture of anhydrous tin(II) chloride

and dry diethylamine in dry *n*-heptane in the temperature range of 25–38 °C under ~~a~~ nitrogen or argon atmosphere.

e. The reaction mixture is stirred for 12 hours under ~~a~~ nitrogen or argon atmosphere.

f. The reaction mixture is filtered under ~~a~~ nitrogen or argon atmosphere.

g. The solid residue is washed with dry *n*-heptane.

h. The combined organic layer is evaporated to dryness.

7. ~~Process for the preparation~~ Production process of liquid tin(II) alkoxides, as described in Claim 1 or 4, also includes the following best procedure as following described:

a. Anhydrous tin(II) chloride is dissolved in dry *n*-heptane in the temperature range of 25–38 °C. The solution is stirred for 30-60 minutes under ~~a~~ nitrogen or argon atmosphere.

b. Dry diethylamine in 2 or 3 mole equivalence of anhydrous tin(II) chloride is added into the reaction vessel in the temperature range of 15 – 20 °C. The resulting solution is stirred for 36 hours under ~~a~~ nitrogen or argon atmosphere.

c. Dry alcohol (where R = *n*-C_4H_9, *n*-C_6H_{13}, *n*-C_8H_{17}) in 2 or 3 mole equivalence of anhydrous tin(II) chloride is added under nitrogen or argon. The temperature is controlled in the range of 25–38 °C.

d. The reaction mixture is stirred for 12 hours under ~~a~~ nitrogen or argon atmosphere.

e. The reaction mixture is filtered under nitrogen or argon.

f. The solid residue is washed with dry *n*-heptane (100–150 mL)

g. The combined organic phase ~~is~~ was evaporated to dryness and nitrogen or argon is purged into the ~~evaporation flask~~product before removing from an evaporator.

8. Liquid tin(II) alkoxides, as obtained from one of the Claim 1-5, are viscous, dark yellow liquids. They ~~are soluble~~dissolve in common organic solvents. The ~~general~~ molecular formula of these compounds is $Sn(OR)_2$ where R is CH_3, C_2H_5, *n*-C_3H_7, *n*-C_4H_9, *n*-C_5H_{11}, *n*-C_6H_{13}, *n*-C_7H_{15}, and *n*-C_8H_{17}.