

CLAIMS

1. A process for preparing a used ionic liquid catalyst for safe disposal, comprising:
hydrolyzing the used ionic liquid catalyst comprising an anhydrous metal halide with a
basic solution at a temperature from -20°C to 90°C to produce a hydrolyzed product, evolve a
5 hydrogen halide gas;
wherein as the hydrogen halide gas is evolved it is dissolved into the basic solution and
is neutralized to produce a hydrolysed slurry with a pH of 4 to 10 for safe disposal.
2. The process of claim 1, wherein the used ionic liquid catalyst is a chloroaluminate.
3. The process of claim 2, wherein the used ionic liquid catalyst is selected from the group
10 consisting of a hydrocarbyl-substituted-pyridinium chloroaluminate, a hydrocarbyl-substituted-
imidazolium chloroaluminate, a quaternary amine chloroaluminate, a trialkyl amine hydrogen
chloride-chloroaluminate, an alkyl pyridine hydrogen chloride-chloroaluminate, and mixtures
thereof.
4. The process of any one of the preceding claims, wherein the anhydrous metal halide is
15 selected from the group consisting of AlCl_3 , AlBr_3 , GaCl_3 , GaBr_3 , InCl_3 , InBr_3 , and mixtures
thereof.
5. The process of any one of the preceding claims, wherein the hydrolyzing is done with a
basic solution comprising a base selected from the group consisting of LiOH , NaOH , KOH ,
 CsOH , RbOH , $\text{Mg}(\text{OH})_2$, $\text{Ca}(\text{OH})_2$, $\text{Sr}(\text{OH})_2$, NH_4OH , $\text{Ba}(\text{OH})_2$, and mixtures thereof.
- 20 6. The process of any one of the preceding claims, wherein less than a full charge of the
used ionic liquid catalyst is removed from a hydrocarbon conversion process unit such that the
hydrocarbon conversion process unit operates continuously.
7. The process of any one of the preceding claims, wherein the used ionic liquid catalyst
comprises conjunct polymer.
- 25 8. The process of any one of the preceding claims, additionally comprising separating the
non-water-reactive aqueous phase from the hydrocarbon phase.
9. The process of any one of claims 1 to 5, wherein the hydrolyzing proceeds continuously
by adding the used ionic liquid catalyst to a hydrolysis vessel while the hydrolyzed product is
taken out of the hydrolysis vessel.
- 30 10. The process of any one of the preceding claims, additionally comprising adjusting a pH of
the basic solution to produce the hydrolysed slurry having the pH of 4 to 10 for disposal.
11. The process of any one of the preceding claims, wherein the pH for disposal is 5 to 9.

12. The process of any one of the preceding claims, wherein the used ionic liquid catalyst and the basic solution are mixed together at a molar ratio of used ionic liquid catalyst to a base of 0.5:1 to 1:20.
13. The process of any one of the preceding claims, wherein the hydrolyzed product is sent
5 to a non-hazardous waste handling facility.
14. An apparatus when used to prepare a used catalyst for safe disposal, according to the process of any one of the preceding claims.

CLAIMS

1. A process for preparing a used ionic liquid catalyst for safe disposal, comprising:
hydrolyzing the used ionic liquid catalyst comprising an anhydrous metal halide with a basic solution at a temperature from -20°C to 90°C to produce a hydrolyzed product, evolve a hydrogen halide gas;
wherein as the hydrogen halide gas is evolved it is dissolved into the basic solution and is neutralized to produce a hydrolysed slurry with a pH of 4 to 10 for safe disposal.
2. The process of claim 1, wherein the used ionic liquid catalyst is a chloroaluminate.
3. The process of claim 2, wherein the used ionic liquid catalyst is selected from the group consisting of a hydrocarbyl-substituted-pyridinium chloroaluminate, a hydrocarbyl-substituted-imidazolium chloroaluminate, a quaternary amine chloroaluminate, a trialkyl amine hydrogen chloride chloroaluminate, an alkyl pyridine hydrogen chloride chloroaluminate, and mixtures thereof.
4. The process of any one of the preceding claims, wherein the anhydrous metal halide is selected from the group consisting of AlCl_3 , AlBr_3 , GaCl_3 , GaBr_3 , InCl_3 , InBr_3 , and mixtures thereof.
5. The process of any one of the preceding claims, wherein the hydrolyzing is done with a basic solution comprising a base selected from the group consisting of LiOH , NaOH , KOH , CsOH , RbOH , $\text{Mg}(\text{OH})_2$, $\text{Ca}(\text{OH})_2$, $\text{Sr}(\text{OH})_2$, NH_4OH , $\text{Ba}(\text{OH})_2$, and mixtures thereof.
6. The process of any one of the preceding claims, comprising removing the used ionic liquid catalyst from a hydrocarbon conversion process unit and wherein less than a full charge of the used ionic liquid catalyst is removed from the hydrocarbon conversion process unit such that the hydrocarbon conversion process unit operates continuously.
7. The process of any one of the preceding claims, wherein the used ionic liquid catalyst comprises conjunct polymer.
8. The process of any one of claims 1 to 5, wherein the hydrolyzing proceeds continuously by adding the used ionic liquid catalyst to a hydrolysis vessel while the hydrolyzed product is taken out of the hydrolysis vessel.

9. The process of any one of the preceding claims, additionally comprising adjusting a pH of the basic solution to produce the hydrolised slurry having the pH of 4 to 10 for disposal.
10. The process of any one of the preceding claims, wherein the pH for disposal is 5 to 9.
11. The process of any one of the preceding claims, wherein the used ionic liquid catalyst and the basic solution are mixed together at a molar ratio of used ionic liquid catalyst to a base of 0.5:1 to 1:20.
12. The process of any one of the preceding claims, wherein the hydrolyzed product is sent to a non-hazardous waste handling facility.