CLAIMS

What is claimed is:

1. A process for producing diaryl carbonates comprising:

(a) reacting phosgene and a monohydroxyl aryl compound in the presence of a suitable catalyst to form a diaryl carbonate and a solution comprising an alkali chloride;

(b) separating the diaryl carbonate from the solution;

(c) adjusting the pH of the solution to a value of less than or equal to 8 to form a pH-adjusted solution;

(d) treating the pH-adjusted solution with an adsorbent to form a treated solution;

(e) subjecting at least a portion of the treated solution to electrochemical oxidation to form chlorine and an alkali hydroxide solution; and

(f) recycling at least a portion of one or both of the chlorine and the alkali hydroxide solution.

2. The process according to claim 1, wherein recycling at least a portion of the chlorine comprises feeding the portion to a reaction with carbon monoxide to form at least a portion of the phosgene reacted with the monohydroxyl aryl compound.

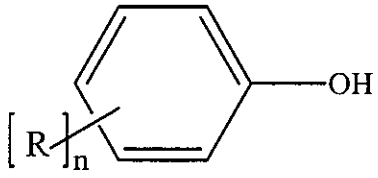
3. The process according to claim 1, wherein recycling at least a portion of the alkali hydroxide solution comprises feeding the portion to the reaction of the phosgene and the monohydroxyl aryl compound.

4. The process according to claim 1, further comprising subjecting one or more of the solution, the pH-adjusted solution and the treated solution to a separation to remove an amount of residual solvent.

21. The process according to claim 1, wherein the electrochemical oxidation is carried out using an electrolysis cell having an anode and a membrane, and wherein the anode has a surface area greater than a surface area of the membrane.

22. The process according to claim 1, wherein the electrochemical oxidation is carried out at a current density of 2 to 6 kA per m^2 of membrane; a temperature of 70 to 100°C; an absolute pressure of 1.0 to 1.4 bar; and a differential pressure between an anode compartment and a cathode compartment of 20 to 150 mbar.

23. The process according to claim 1, wherein the monohydroxyl aryl compound comprises a phenol compound of the general formula (I):

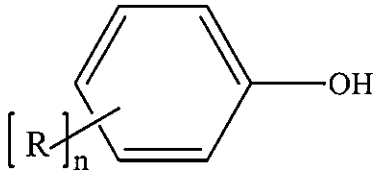


(I)

wherein each R independently represents a substituent selected from the group consisting of hydrogen, halogens, C_{1-9} alkyl groups, C_{1-9} alkoxy groups, C_{1-9} carbonyl groups, and C_{1-9} alkoxycarbonyl groups; and n represents an integer of 0 to 5.

24. A process for producing diaryl carbonates comprising:

(a) reacting phosgene and a phenol compound of the general formula (I) in the presence of a suitable catalyst to form a diaryl carbonate and a solution comprising an alkali chloride;



(I)

wherein each R independently represents a substituent selected from the group consisting of hydrogen, halogens, C_{1-9} alkyl groups, C_{1-9} alkoxy groups, C_{1-9} carbonyl groups, and C_{1-9} alkoxycarbonyl groups; and n represents an integer of 0 to 5;

(b) separating the diaryl carbonate from the solution;

(c) adjusting the pH of the solution with hydrogen chloride to a value of less than or equal to 7 to form a pH-adjusted solution;

(d) treating the pH-adjusted solution with an adsorbent to form a treated solution;

(e) subjecting at least a portion of the treated solution to electrochemical oxidation to form chlorine and an alkali hydroxide solution; and

(f) recycling at least a portion of one or both of the chlorine and the alkali hydroxide solution;

wherein recycling at least a portion of the chlorine comprises feeding the portion to a reaction with carbon monoxide to form at least a portion of the phosgene reacted with the phenol compound of the general formula (I)~~monohydroxyl aryl compound~~; wherein recycling at least a portion of the alkali hydroxide solution comprises feeding the portion to the reaction of the phosgene and the phenol compound of the general formula (I)~~monohydroxyl aryl compound~~; and wherein the electrochemical oxidation is carried out at a current density of 2 to 6 kA per m^2 of membrane; a temperature of 70 to 100°C; an absolute pressure of 1.0 to 1.4 bar; and a differential pressure between an anode compartment and a cathode compartment of 20 to 150 mbar.

25. The process according to claim 1, wherein the separation of the diaryl carbonate from the solution according to (b) comprises at least the following steps:

(aa) separation of diaryl carbonate-containing organic phase and aqueous alkali chloride-containing waste water solution

(bb) washing the diaryl carbonate-containing organic phase obtained in step (aa) at least once,