THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A magnesium recovery method including:

electrolyzing seawater;

separating anodic electrolyzed water and cathodic electrolyzed water produced by electrolysis of the seawater;

inputting alkaline material into the anodic electrolyzed water to adjust pH;

precipitating magnesium as magnesium hydroxide in the cathodic electrolyzed water, and recovering the magnesium hydroxide; and

intermixing the anodic electrolyzed water after pH adjustment and the cathodic electrolyzed water after recovery of the magnesium hydroxide, and discharging the intermixed water in a state where a pH of the intermixed water is identical to a pH of the seawater.

2. The magnesium recovery method according to claim 1, wherein the alkaline material is waste concrete.

3. The magnesium recovery method according to claim 1, wherein iron, which is a soluble metal, is used in the anode-side electrode to cause dissolution of ferric ions in the anodic electrolyzed water in the seawater electrolysis process.

4. A magnesium recovery apparatus, including:

an electrolysis tank having an anode and a cathode;

a barrier film which partitions an interior of the electrolysis tank into an anode-side region containing the anode, and a cathode-side region containing the cathode;

a first treatment tank which stores anodic electrolyzed water produced in the anode-side region;

a second treatment tank which stores cathodic electrolyzed water produced in the cathode-side region;

a power-supply unit which supplies power to the anode and the cathode;

an alkaline material input device which inputs alkaline material to the first

treatment tank; and

a recovery unit which recovers magnesium hydroxide precipitated in the second treatment tank,

wherein wastewater from the first treatment tank and wastewater from the second treatment tank are intermixed, and discharged in a state where a pH of the intermixed water is identical to a pH of seawater.

5. The magnesium recovery apparatus according to claim 4, wherein the power-supply unit has at least one of photovoltaic cell, fuel cell, wind power generator, wave power generator, ocean thermal power generator, and solar thermal power generator.

6. The magnesium recovery apparatus according to claim 4, wherein the power-supply unit contains a fuel cell which uses hydrogen gas generated on the cathode-side region, and oxygen gas generated on the anode-side region.

7. The magnesium recovery apparatus according to claim 4, wherein the alkaline material inputted from the alkaline material input device is waste concrete.

8. The magnesium recovery apparatus according to claim 4, wherein the anode contains iron as a consumable electrode, and the consumable electrode dissolves ferric ions.

CLAIMS

1. A magnesium recovery method comprising:

electrolyzing seawater;

separating anodic electrolyzed water and cathodic electrolyzed water produced by electrolysis of the seawater;

inputting alkaline material into the anodic electrolyzed water to adjust pH;

precipitating magnesium as magnesium hydroxide in the cathodic electrolyzed water, and recovering the magnesium hydroxide; and

intermixing the anodic electrolyzed water after pH adjustment and the cathodic electrolyzed water after recovery of the magnesium hydroxide, and discharging the intermixed water in a state where a pH of the intermixed water is identical to a pH of the seawater.

2. The magnesium recovery method according to claim 1, wherein the alkaline material is waste concrete.

3. The magnesium recovery method according to claim 1, wherein iron, which is a soluble metal, is used in the anode-side electrode to cause dissolution of ferric ions in the anodic electrolyzed water in the seawater electrolysis process.

4. A magnesium recovery apparatus, comprising:

an electrolysis tank having an anode and a cathode;

a barrier film which partitions an interior of the electrolysis tank into an anode-side region containing the anode, and a cathode-side region containing the

cathode;

a first treatment tank which stores anodic electrolyzed water produced in the anode-side region;

a second treatment tank which stores cathodic electrolyzed water produced in the cathode-side region;

a power-supply unit which supplies power to the anode and the cathode;

an alkaline material input device which inputs alkaline material to the first treatment tank; and

a recovery unit which recovers magnesium hydroxide precipitated in the second treatment tank,

wherein wastewater from the first treatment tank and wastewater from the second treatment tank are intermixed, and discharged in a state where a pH of the intermixed water is identical to a pH of seawater.

5. The magnesium recovery apparatus according to claim 4, wherein the power-supply unit has at least one of photovoltaic cell, fuel cell, wind power generator, wave power generator, ocean thermal power generator, and solar thermal power generator.

6. The magnesium recovery apparatus according to claim 4, wherein the power-supply unit contains a fuel cell which uses hydrogen gas generated on the cathode-side region, and oxygen gas generated on the anode-side region.

7. The magnesium recovery apparatus according to claim 4, wherein the alkaline material inputted from the alkaline material input device is waste concrete.

8. The magnesium recovery apparatus according to claim 4, wherein the anode contains iron as a consumable electrode, and the consumable electrode dissolves ferric ions.