

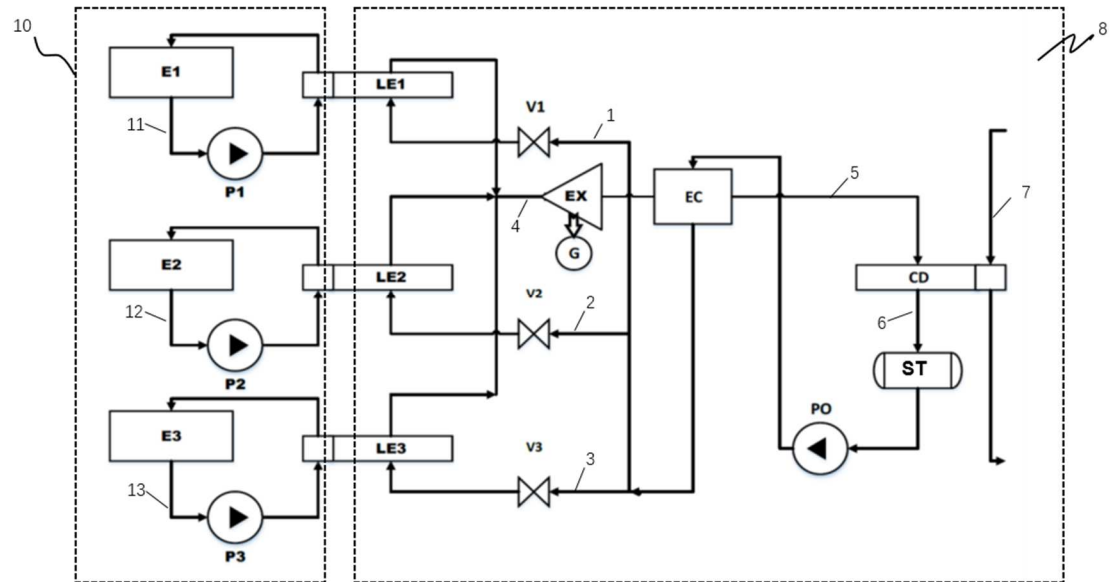


Fig 1

Claims

1. A system for using an Organic Rankine Cycle to recover electrolyte waste heat for electricity generation, characterized in that the system comprises at least one electrolyte cycle loop and at least one Organic Rankine Cycle loop, wherein an electrolyte heat exchanger is simultaneously located in the two cycle loops, and an electrolyte circulating stream flowing in the electrolyte cycle loop exchanges heat via the electrolyte heat exchanger with an organic working medium stream flowing in the Organic Rankine Cycle loop.
2. A system according to Claim 1, characterized in that the organic working medium stream comprises tetrafluoroethane or Freon.
3. A system according to Claim 1, characterized in that the electrolyte cycle loop further comprises an electrolyser and an electrolyte circulation pump, wherein the electrolyte circulating stream flowing out of the electrolyser is conveyed into the electrolyte heat exchanger via the electrolyte circulation pump, and flows back to the electrolyser after being cooled by the organic working medium stream flowing in the Organic Rankine Cycle loop.
4. A system according to Claim 3, characterized in that the electrolyte circulating stream has a temperature of 85 – 90° C after being cooled in the electrolyte heat exchanger.
5. A system according to Claim 1, characterized in that the Organic Rankine Cycle loop comprises a Rankine expander and a generator coupled thereto, a Rankine Cycle economizer, a Rankine Cycle condenser, a Rankine Cycle pump and the electrolyte heat exchanger, wherein the organic working medium stream is heated and vaporized by the electrolyte circulating stream in the electrolyte heat exchanger, forming a gaseous working medium stream which does work by expanding in the Rankine expander and is then cooled by a condensed working medium stream in the Rankine Cycle economizer, and is then condensed by cooling water in the Rankine Cycle condenser to obtain the condensed working medium stream, which is conveyed by the Rankine Cycle pump into the Rankine Cycle economizer in which it is heated by the gaseous working medium stream before being conveyed into the electrolyte heat exchanger again, thus forming a cycle; and the generator coupled to the expander converts the work of expansion to electrical energy.
6. A method for using the system according to Claim 1 to recover electrolyte waste heat, characterized in that at least one electrolyte cycle loop and at least one Organic Rankine Cycle loop are provided, wherein an electrolyte heat exchanger is simultaneously located in the two cycle loops, and an electrolyte circulating stream flowing in the electrolyte cycle loop exchanges heat via the electrolyte heat exchanger with an organic working medium stream flowing in the Organic Rankine Cycle loop.
7. A method according to Claim 6, characterized in that the organic working

medium stream comprises tetrafluoroethane or Freon.

8. A method according to Claim 6, characterized in that the electrolyte circulating stream has a temperature of 85 – 90° C after being cooled in the electrolyte heat exchanger.
9. A method according to Claim 6, characterized in that an electrolyser and an electrolyte circulation pump are further provided in the electrolyte cycle loop, wherein the electrolyte circulating stream flowing out of the electrolyser is conveyed into the electrolyte heat exchanger via the electrolyte circulation pump, and flows back to the electrolyser after being cooled by the organic working medium stream flowing in the Organic Rankine Cycle loop.
10. A method according to Claim 6, characterized in that a Rankine expander and a generator coupled thereto, a Rankine Cycle economizer, a Rankine Cycle condenser and a Rankine Cycle pump are further provided in the Organic Rankine Cycle loop, wherein the organic working medium stream is heated and vaporized by the electrolyte circulating stream in the electrolyte heat exchanger, forming a gaseous working medium stream which does work by expanding in the Rankine expander and is then cooled by a condensed working medium stream in the Rankine Cycle economizer, and is then condensed by cooling water in the Rankine Cycle condenser to obtain the condensed working medium stream, which is conveyed by the Rankine Cycle pump into the Rankine Cycle economizer in which it is heated by the gaseous working medium stream before being conveyed into the electrolyte heat exchanger again, thus forming a cycle; and the generator coupled to the expander converts the work of expansion to electrical energy.