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## Principle

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Gas-lye treater

2013-06-27 17:25:24 Source:Purification Equipment Research Institute of CSIC

Hits:2590



Gas-lye treater is of skid-mounted structure which is composed of lye heat exchanger, oxygen (hydrogen) separator, hydrogen (oxygen) washer and cooler, lye circulation pump, lye filter, valves, pipelines, fittings, hydrogen(oxygen) purity analyzers, pneumatic diaphragm regulating valve, primary instrument, frame, ect.

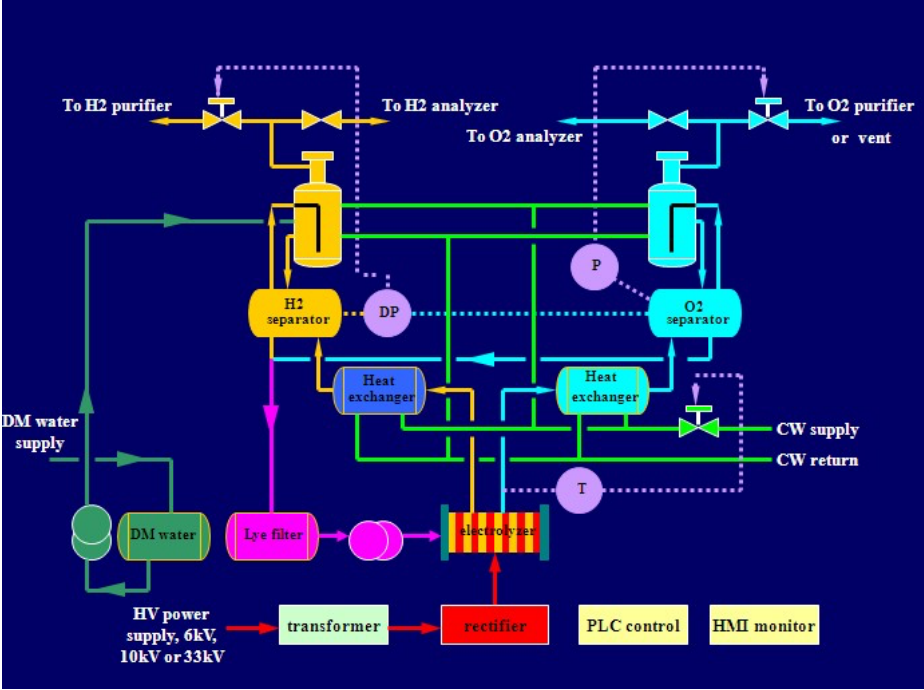
Structure of gas-lye processor is shown as below:



1.	frame	2.	cable bracket
3.	explosion-proof junction box	4.	hydrogen separator
5.	Lye heat exchanger	6.	hydrogen washer
7.	drop catcher	8.	oxygen washer
9.	oxygen separator	10.	hydrogen analyzer
11.	oxygen analyzer	12.	circulating pump

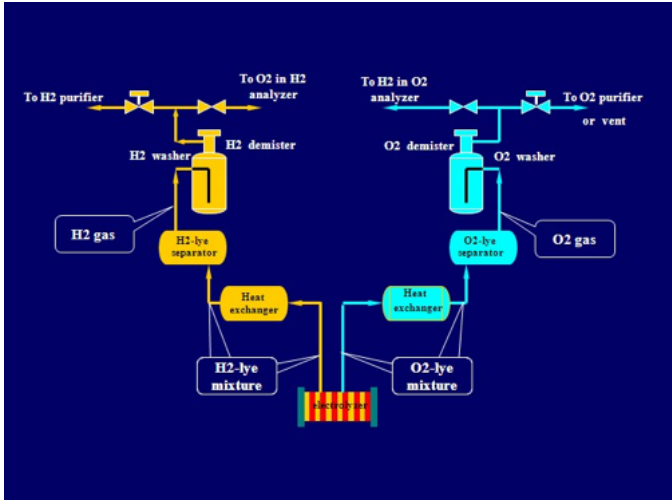
The following is typical flow chart of gas-lye treater, hydrogen and oxygen generated from eletrolyzer enters into gas-lye treater separately, and enters into their storage tank or purification system after cooling, separating, dehumidifying; electrolyte is pumped back to electrolyzer by lye circulation pump after the impurities filtered out.

In line with different mediums, gas-lye treater could be parted: hydrogen system, oxygen system, lye circulating system, water and lye supplementary system and cooling water system.



Typical gas-lye treater flow chart

Hydrogen, oxygen gas system



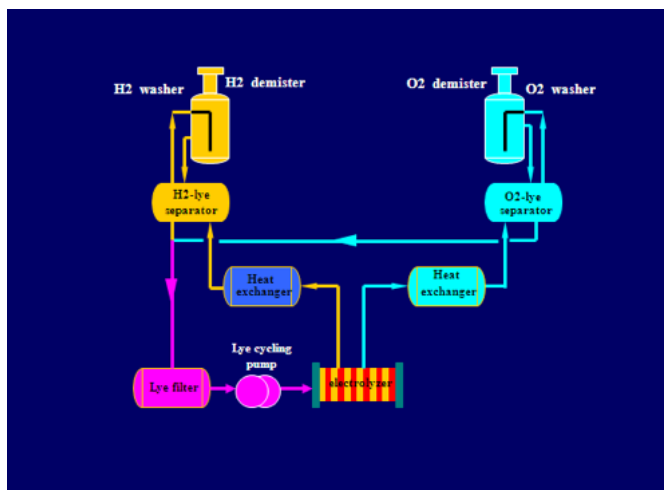
Hydrogen, oxygen gas system

Hydrogen-lye mixture generated from electrolyzer is cooled by heat exchanger, then hydrogen and lye is separated by gravity in hydrogen-lye separator, hydrogen flows into hydrogen washer via upper layer pipeline, cooled and washed by washer and dehumidified by drop remover for minimizing lye and water content in hydrogen gas, at last gas vents via diaphragm regulating valve or enters into purification system.

Oxygen process is the same with hydrogen process.

Electrolyte circulation system

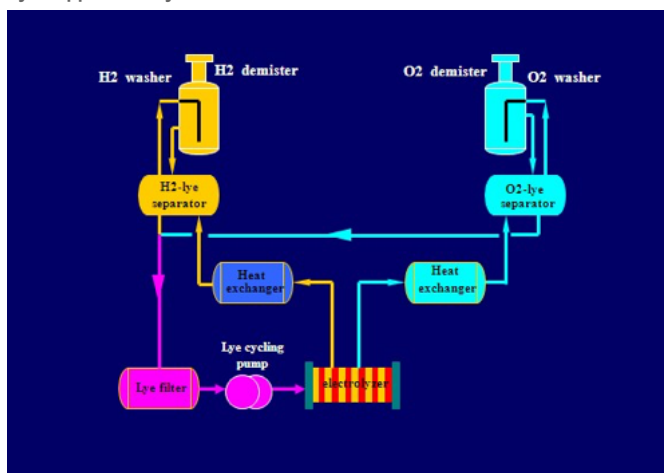
Lye in Hydrogen(oxygen)



Electrolyte flow

separator gathered in connecting pipe at bottom of separator, and is driven by lye circulation pump to filter out impurities in lye filter, then enters into electrolyzer for electrolysis reaction which forms the closed-loop system. Lye in washer could get back to gas-lye separator through overflow pipe.

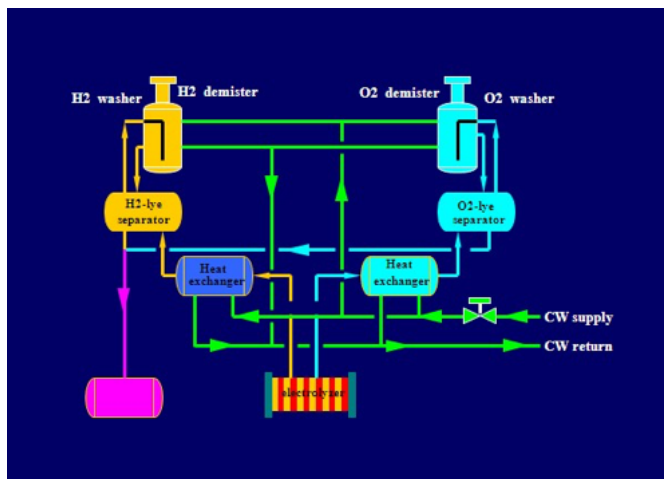
### Lye supplement system



Lye supplement system flow

As hydrogen generation system run, water is consuming which can be reflected from level of hydrogen (oxygen) separator. When level is lower than system setting value, feed-water pump starts automatically to inject water from water tank into hydrogen (oxygen) washer and overflows into separator, when separator level rise to set upper limit, feed-water pump stops; when lye concentration drops, small amount of alkali can be added to lye tank for electrolyte circulating.

### Cooling water circulation system



Cooling water circulation system flow

Cooling water from main pipeline is divided into two loops, one is to lye heat exchanger via pneumatic ball valve to cool circulating lye and to maintain temperature of electrolyzer at  $85\pm 5^{\circ}\text{C}$  by adjusting diaphragm valve to control cooling water flow; The other is to hydrogen (oxygen) washer via ball valve for cooling gas, in order to reduce lye content and water content in gas, and keep outlet temperature less than  $40^{\circ}\text{C}$ .

【Editor:】

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