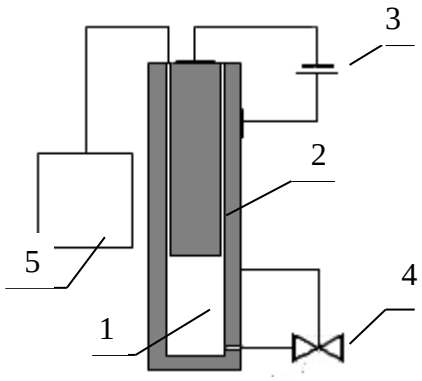
Heat recovery of supercritical conditions (SC)

In the reactor (recuperator) on SR water has close to critical temperature, and pressure — is much less critical. The fuel which is at the room temperature moves in the reactor the pump of low pressure (pressure forcings — units of the atmospheres). At hit on a hot wall of the reactor fuel will start boiling as temperature of a wall of the reactor is higher than water boiling temperature. As fuel is in the reactor under pressure, the bubbles which are formed at boiling up and experiencing action of pressure will start collapsing (a classical task of Rayleigh). Taking into account initial (close to critical) temperature of a bubble and an inevitable warming up because of viscosity of real liquid can be expected that at a collapse of a bubble conditions of phase transition of water to supercritical condition can be realized. Then in volume of the reactor will take place multiple focal — cavitational — fuel oxidation by supercritical water. At removal of electric energy from a recuperator, working substance comes back to a state close to the normal. Then process repeats.



Pic.1

1. a reaction zone in the cylindrical case from CrNi or a composite alloy
2. the cathode for obtaining EMF
3. galvanic cell
4. the reducing device
5. incinerator

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— uses of the pump of a high pressure,

— presentations of increased requirements to reactor case durability

and thus to improve economic indicators of a recuperator.

The principle of action consists that at achievement of conditionally certain temperature, the active environment passes from one state into another, changing the physical and chemical properties. Under the influence of electrochemical processes, active agent generates the electromotive force (EMF) proportional to the energy absorbed by this substance. Selection of energy returns the active environment in an initial state. Between the electric and brought thermal energys which is selected there is a balance that allows process of recovery to proceed continuously without use of account materials / medium. In a type of lack of the worn-out parts and expendables, the resource of a similar recuperator in the theory is limited only by external factors. The expected efficiency more than 60%.