

LIQUID HEATING APPARATUS AND LIQUID HEATING METHOD

ABSTRACT

Provided is a liquid heating apparatus capable of heating fluid such
5 as peroxosulfuric acid solution to high temperature in a short time. The
heating apparatus includes: a flow channel member forming a flow channel 4
allowing liquid to flow and having flow channel thickness of 10 mm or
smaller, the flow channel member composed of material transmitting
near-infrared rays; and a near-infrared heaters 7, 8 placed over the outside
10 of at least one of opposite flow channel surfaces of the flow channel and
heating the liquid in the flow channel. The liquid flowing through the flow
channel is instantaneously and evenly heated using near-infrared rays. It
is preferable that spacers 6 be further provided within the flow channel 4 in
order to limit the volume of the flow channel. Since not only the residence
15 time in the heating apparatus can be shortened but the possible largest heat
transfer area can be also maintained by decreasing the volume of the flow
channel of the heating apparatus and by increasing the flow velocity in the
heating apparatus, it is possible to increase the temperature of liquid to be
heated to high temperature in a very short time even if the preset
20 temperature of heat transfer surfaces is low.

FIG. 1