Patented Jan. 3, 1933 1,893,051

UNITED STATES PATENT OFFICE

HERBERT H. DOW, OF MIDLAND, MICHIGAN, ASSIGNOR TO THE DOW CHEMICAL COMPANY, OF MIDLAND, MICHIGAN, A CORPORATION OF MICHIGAN

HEAT-ENERGY TRANSFER MEDIUM

No Drawing. Application filed October 30, 1926. Serial No. 145,377.

In heat exchange and transfer usage, ordinarily steam and water are concerned, although liquids of high boiling point would be much more advantageous. Some such liquids which are desirable in many respects, in certain conditions of usage exhibit tendencies with respect to their changes of physical state not favorable to the particular use in view, and it is among the objects of the present invention to suitably modify the properites of such liquids. Other objects and advantages will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the features hereinafter fully described, and particularly pointed out in the claims, the following description setting forth in detail but one of the various ways in which the principle of the invention may be used.

Where a substance of high boiling point is employed as the heat-energy transfer medium in a system in which a part is liable to have its temperature reduced to a relatively low point, for instance, 80° C. or less, or where the entire system is at times subject to such a temperature reduction, the tendency of the high boiling medium to then solidify may be an objection.

Again, in some circumstances there may be an abrupt vaporization in a very circumscribed area in the system and a consequent tendency to damage by local over-heating where rather small tubes for instance are used.

In accordance with the present invention, I provide effective heat-energy transfer media available for an extended range of use, by compounding a high boiling material and another substance or substances, to modify the tendencies above noted. With components of different boiling point, the presence of higher boiling compounds guards against abrupt vaporization and local over-heating. By suitable choice also the temperature of solidification or freezing point as it may be termed can be reduced within feasible limits as desired.

Examples of feasible materials are diphenyl oxide admixed with para-hydroxy-diphenyl or pyrene or naphthalene or all of them together. For instance, diphenyl oxide ($C_{12}H_{10}O$) with not over 25% of pyrene ($C_{16}H_{10}$) allows a boiling point range from 260 to 400° C. Again, by compounding about 20 parts of naphthalene with about 80 parts of diphenyl oxide, a medium may be had which solidifies at about 60° C., while its temperature range for heat-transfer is satisfactory, extending to high ranges. Or, diphenyl oxide, pyrene and naphthalene may be used together.

Other modes of applying the principle of the invention may be employed, change being made as regards the details disclosed, provided the means stated by any of the following claims or the equivalent of such be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. A heat-transfer medium, which comprises diphenyl oxide and naphthalene.

2. A heat transfer medium which comprises diphenyloxide 80 per cent. and naphthalene 20 per cent.

3. A heat transfer medium which consists of diphenyl oxide having admixed therewith at least one of the organic compounds naphthalene, pyrene, para-hydroxy-dipehnyl.

4. A heat transfer medium which comprises diphenyl oxide and pyrene.

5. A heat transfer medium which consists of diphenyl oxide containng pyrene in amount up to 25 per cent.

6. A heat transfer medium which comprises diphenyl oxide and para-hydroxy-diphenyl.

Signed by me this twenty-second day of October, 1926.

HERBERT H. DOW.