Claims

1. Process for dehumidifying a moist gas mixture **G** in an apparatus $\mathbf{V_1}$, comprising the steps of:

   (a) contacting the moist gas mixture **G** with a liquid absorption medium $\mathbf{A_{VE}}$ comprising at least one salt selected from 1-ethyl-3-methylimidazolium diethylphosphate,

   wherein the liquid absorption medium $\mathbf{A_{VE}}$ at least partially absorbs water from the moist gas mixture **G**,

   to obtain a liquid absorption medium $\mathbf{A_{VE1}}$ having an elevated water content compared to the liquid absorption medium $\mathbf{A_{VE}}$ and a gas mixture $\mathbf{G_1}$ having a relatively low water content compared to the moist gas mixture **G**,

   (b) at least partially removing water from the liquid absorption medium $\mathbf{A_{VE1}}$ to obtain a liquid absorption medium $\mathbf{A_{VE2}}$ having a relatively low water content compared to the liquid absorption medium $\mathbf{A_{VE1}}$,

   wherein the apparatus $\mathbf{V_1}$ at least partially comprises a surface made of an aluminium material of construction $\mathbf{O_{Al}}$ and in the apparatus $\mathbf{V_1}$ at least one of the liquid absorption media selected from the group consisting of $\mathbf{A_{VE}}$, $\mathbf{A_{VE1}}$, $\mathbf{A_{VE2}}$ contacts the surface made of an aluminium material of construction $\mathbf{O_{Al}}$ via at least one contact surface.

2. Process according to Claim 1, wherein the liquid absorption medium $\mathbf{A_{VE}}$ is an aqueous solution in which the total weight of all salts of 1-ethyl-3-methylimidazolium diethylphosphate is at least 70 wt% based on the total weight of the aqueous solution.

3. Process according to Claim 1 or 2, wherein said process is carried out in continuous fashion.

4. Apparatus $\mathbf{V_2}$ for dehumidifying a moist gas mixture, comprising the components

   (i) a liquid absorption medium $\mathbf{A_{VO}}$ comprising at least one salt selected from 1-ethyl-3-methylimidazolium diethylphosphate,

   (ii) at least one water absorption unit $\mathbf{W_{abs2}}$ <103> set up for contacting the moist gas mixture with the liquid absorption medium $\mathbf{A_{VO}}$,

   (iii) at least one water desorption unit $\mathbf{W_{des2}}$ <109> which comprises a heat exchanger $\mathbf{W_{x2}}$ <108> and is set up for at least partially removing water from a liquid absorption medium $\mathbf{A_{VO}}$,

   (iv) and a circuit $\mathbf{U_2}$ which connects the water absorption unit $\mathbf{W_{abs2}}$ <103> with the water desorption unit $\mathbf{W_{des2}}$ <109> and by means of which the liquid absorption medium $\mathbf{A_{VO}}$ may be circulated,

wherein at least one of the components water absorption unit $\mathbf{W_{abs2}}$ <103>, water desorption unit $\mathbf{W_{des2}}$ <109>, circuit $\mathbf{U_2}$ at least partially comprises a surface made of an aluminium material of construction $\mathbf{O_{Al}}$, and

wherein disposed in the apparatus $\mathbf{V_2}$ is at least one contact surface at which the liquid absorption medium $\mathbf{A_{VO}}$ contacts the surface made of an aluminium material of construction $\mathbf{O_{Al}}$.

5. Apparatus $\mathbf{V_2}$ according to Claim 4, wherein $\mathbf{A_{VO}}$ is an aqueous solution in which the total weight of all salts of 1-ethyl-3-methylimidazolium diethylphosphate is at least 70 wt% based on the total weight of the aqueous solution.

6. Apparatus $\mathbf{V_2}$ according to Claim 4 or 5, wherein at least one of the components water absorption unit $\mathbf{W_{abs2}}$ <103>, water desorption unit $\mathbf{W_{des2}}$ <109> is a falling film.

7. Apparatus $\mathbf{V_2}$ according to any of Claims 4 to 6, comprising a further heat exchanger $\mathbf{W_{y2}}$ <107> set up such that liquid absorption medium $\mathbf{A_{VO}}$ sent from the water absorption unit $\mathbf{W_{abs2}}$ <103> to the water desorption unit $\mathbf{W_{des2}}$ <109> is suppliable with heat from liquid absorption medium $\mathbf{A_{VO}}$, said medium being conducted away from the water desorption unit $\mathbf{W_{des2}}$ <109>.

8. Absorption heat pump, comprising an apparatus $\mathbf{V_2}$ according to any of Claims 4 to 7 and, as further components, a condenser, an evaporator and a coolant, wherein the coolant is water.

9. Use of the apparatus $\mathbf{V_2}$ according to any of the Claims 4 to 7 for carrying out a process according to any of Claims 1 to 3.