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Author: Prof. Vladimir Rifert
TERMODISTILLATION, Ukraine

Mr. Petr Barabash
Kyiv Politechnic Institute (NTUU "KPI"), Ukraine

Mr. V Usenko
Kyiv Politechnic Institute (NTUU "KPI"), Ukraine

Mr. Andrii Solomakha
Kyiv Politechnic Institute (NTUU "KPI"), Ukraine

Dr. L.I. Anatychuk
Institute of Thermoelectricity, Chernivtsi, Ukraine

Mr. A.V. Prybyla
Institute of Thermoelectricity, Chernivtsi, Ukraine

IMPROVEMENT THE SYSTEM OF DISTILLATION CASCADE FOR LONG-TERM SPACE FLIGHTS

Abstract

Centrifugal vacuum distillation (CDS) is the most promising technology for all types of waster water in life support systems in space stations and ships. The report analyses several design options for CDS for flight on the Moon, Mars, when astronauts number 2...8 people in the future for possible transport to the planet to 50...100. The main in the selection of the preferred scheme technology CDS is the highest level of TLR with minimum weight and dimensions, and minimal power consumption. The results of testing of several versions of CDS from the thermoelectric heat pump (THP) and to minimum productivity (flight 3...4 people) to Mars and great performance (up to 50...100) for future manned colonies on Mars and Moon. This description is designed and manufactured Co "TERMODISTILLATION" centrifugal vacuum stills with three and five steps distillation and several variants of schemes of energy recovery on the basis of THR and THR have been improved and schemes of their connection to CDS. Shows the test results of the improved CDS in the desalting of solutions of NaCl, urea, mixtures of waster water. Enhanced CDS allow us to reduce specific energy up to 60 Wh/l, to provide the performance of a complex of two CDS to 9 l/h and recovery when desalting of all kinds of waster water up to 98