Paper ID: 74501
interactive

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Late breaking abstracts (LBA)

Author: Mr. Andrii Solomakha
Kyiv Politechnic Institute (NTUU "KPI"), Ukraine, a.solomakha@kpi.ua

Prof. Vladimir Rifert
TERMODISTILLATION, Ukraine, vgrifert@ukr.net

COMPARATIVE ANALYSIS OF THREE- AND FIVE-STAGE DISTILLERS FOR DEEP SPACE MISSIONS

Abstract

The report presents the latest experimental data obtained for centrifugal distillers with three and five stages in the process of water recovery from urine. It is shown that under the same conditions the productivity of a five-stage distiller is exactly 1.7 times higher than that of a three-stage distiller (up to 7 litres per hour for 5 stages and up to 4 l/hour for 3 stages). This testifies to the high-quality manufacturing of devices and good scalability of the system. Water recovery was up to 93 percents. A thermodynamic analysis of the operation of the distiller together with a thermoelectric heat pump has been carried out. Based on the data obtained, the optimal mode of operation of the system with minimal energy consumption is substantiated. This made it possible to reduce energy consumption to 100 Watt*hour/litre. The quality of the water obtained for both distillers met the necessary requirements.