

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Life Support and EVA Systems (6)

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COMPARATIVE ANALYSIS THE VARIOUS TECHNOLOGIES OF CARBON DIOXIDE
CONCENTRATION

Abstract

The Man-made Ecological Systems for interplanetary flights will be based on physical/chemical technologies of crew metabolism product transformation in initial components of an environment. Development of the Carbon Dioxide Concentration System as a part of Integrated Life Support System is essential condition of maintenance providing life and activity of crew in independent long-term interplanetary flights.

PURPOSE of this paper is to examine the various technologies of carbon dioxide concentration considering conditions of the interplanetary autonomous manned spaceflights and/or the planetary orbital station.

APPROACH based on comparative analysis the various technologies of carbon dioxide concentration. The key technologies of the Carbon Dioxide Concentration System are:

- adsorptive, based on physical sorption and chemisorption;
- absorptive, based on electro/chemical and thermal desorption;
- electro/chemical processes, based on cell polarization of fuel element or electro dialysis;
- semi-permeable membranes.

The information review about various technologies of carbon dioxide concentration is examined.

CONCLUSIONS:

- Various technologies of carbon dioxide concentration are analyzed.
- The key technologies for development of the system of concentration Carbon dioxide for the crew's life and activity maintenance in interplanetary flights and/or the planetary orbital station is defined.