

II. UKRAINIAN SCIENTIFIC RESEARCH AND TECHNOLOGICAL EXPERIMENTS PROPOSED FOR THE ISS

II.1. SPACE TECHNOLOGY AND MATERIALS SCIENCE

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Introduction. Production of materials and performance of technological experiments onboard the orbital space stations open new possibilities for development of national aerospace industry. They also provide the unique capabilities of solving the fundamental problems of space technology and materials science.

The two integrated «Material» and «Degradation» projects, which consist of several experiments, are proposed in this field of space science. It is important to accentuate that these experiments are interconnected from the point of view of developing more versatile equipment and optimal use of the available equipment. The third «Diagnostics» project deals with the methods and equipment for control

of defectiveness and stressed state of space constructions.

The purpose of the majority of experiments is to study the influence of space factors on characteristics of elements and units of the ISS as well as on properties of various materials. The influence of space factors and microgravity on mechanical, tribotechnical, and optical-physical parameters of materials and coatings is studied in the integrated «Degradation» project. Special attention is paid also to development of new onboard scientific equipment, its power supply and thermostabilization systems (heat setting), as well as to ground-based simulation of the influence of space factors on various materials.