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**Space material science experiment-Specification for design and
encapsulation of experiment sample ampoules**

空间材料科学实验 实验样品安瓿设计与封装规范

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document was proposed by the Chinese Academy of Sciences.

This document is under the jurisdiction of the National Technical Committee for Space Science and Its Applications Standardization (SAC/TC312).

This document was drafted by: Institute of Metal Research, Chinese Academy of Sciences,

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Introduction

The purpose of this document is to standardize the design and packaging of sample ampoules for space material science experiments, and to guide participants in the design and packaging of ampoules.

The experimental sample ampoules that meet the scientific experimental goals and engineering requirements are manufactured to ensure the safe and efficient operation of space experiments.

The issuing agency of this document calls attention to the fact that when declaring compliance with this document, it may involve patents related to general sample ampoules in Chapter 4. Use of.

The issuing organization of this document takes no position on the authenticity, validity and scope of this patent.

The patent holder has promised to the issuing agency of this document that he is willing to cooperate with any applicant under reasonable and non-discriminatory terms and conditions.

The patent holder's statement has been filed with the issuing authority of this document.

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Please note that in addition to the above patents, some of the contents of this document may still involve patents. The issuing agency of this document does not assume the responsibility for identifying patents. responsibility.

Space Materials Science Experiment Laboratory sample ampoule design and packaging specifications

1 Scope

This document specifies the design and packaging requirements for sample ampoules for space material science experiments, and describes the design verification, inspection, and packaging process records.

Methods for recording and status confirmation.

This document is applicable to the use of multi-function high temperature furnaces in space experimental platforms (including inside and outside the cabin) or on the surface of planets and other space environments.

Design and packaging of ampoules for space material science experiment samples.

2 Normative references

GB/T 30114.1

GB/T 30114.7

GB/T 32527

GB/T 37469

GB/T 37844

3 Terms and definitions

The terms and definitions defined in GB/T 30114.1, GB/T 30114.7, GB/T 32527, GB/T 37469 and GB/T 37844 apply in this document.

4 Sample ampoule structure

The sample ampoule consists of a quartz ampoule, a chuck and an outer sleeve, and its structural schematic diagram is shown in Figure 1.

a) Quartz ampoule. It is made of a quartz outer tube and a quartz top tube, with a vacuum or sealed interior, and is used to place samples and supporting crucibles.

The bottom of the quartz outer tube is generally designed as a hemispherical shape, and the top quartz top tube is connected to the chuck, as shown in Figure 1.

b) Chuck. used to hold the sample ampoule and move it between the material silo and the furnace of the material experiment device, and to manually replace the sample ampoule and the sample ampoule. It is usually made of metal materials and can be a single body or a combination of multiple bodies. The gap between the chuck and the quartz top tube can generally be connected with high temperature glue.

c) Outer tube. The outer tube is designed for safety protection. On the one hand, it strengthens the mechanical environment resistance of the sample ampoule; on the other hand, when the bottle is accidentally broken, it can protect the furnace of the experimental device from damage. The outer sleeve can generally be made of high temperature resistant and anti-oxidation metal alloy, such as stainless steel or nickel-based alloy, is fixedly connected to the chuck in a suitable manner, such as spot

welding.

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