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Surface chemical analysis -- Data transfer format for scanning probe microscopy

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the translation method equivalent to using ISO 28600.2011 "surface chemical analysis scanning probe microscope data transmission format."

This standard was proposed and managed by the National Microbeam Standardization Technical Committee (SAC/TC38).

This standard was drafted by. Sun Yat-Sen University.

Introduction

In the field of surface topography and chemical analysis, many commercial scanning probe microscopes (SPMs) are used in various environments. These SPM

Instruments provide scientists and engineers with a wealth of analytical techniques and variable operating parameters. Due to the entire data acquisition and processing of SPM

The department can be digitally controlled by a computer with memory, so all data and parameters can be recorded in digitized files. but,

Because there is no standard SPM data format, data from different manufacturers' instruments is difficult to transmit, exchange, share, and archive. In addition,

The complexity of the data processing required to interpret the data makes it critical to maintain a complete record of data acquisition and preprocessing. So, to

Increased exchange, consistent interpretation and processing of data from different instruments, and reduction of uncertainty in data analysis require a number

According to the standard format of transmission.

Surface chemical analysis

Scanning Probe Microscope Data Transmission Format

1 Scope

This standard specifies the scanning probes to be displayed via cable, LAN, WAN, or other communication lines via a parallel or serial interface.

Micromirror (SPM) data is transferred from computer to computer format. The transmitted data appears on ordinary computer monitors or printers

Those characters are encoded.

The format is designed for SPM data such as scanning tunneling microscope (STM), atomic force microscopy (AFM) and use

Surface analysis of sharp probes on the surface of the article. This format covers single-channel imaging, multi-channel imaging, and single-point spectrum

The data available will be extended to two-dimensional spectral imaging in future releases.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article

Pieces. For undated references, the latest version (including all amendments) applies to this document.

ISO 14976 Surface Chemical Analysis-Datatransferformat

3.1 Overview

The basic idea of the SPM data transmission format is that the format is readable, writable, transferable, and adequate with common computer systems and communications equipment.

The flexibility to facilitate the future expansion of SPM-derived instruments is sufficiently versatile to accommodate a variety of measured physical quantities. To ensure the data office

Rationale and remote communication are easy to use. It is advantageous to use only characters that appear on ordinary monitors or printing devices because this is transmitted according to the communication protocol.

There are no difficulties with these characters and it is also possible to manually check the data. This is the principle followed when designing this format. This principle is similar to the

current

Some international standards for surface chemical analysis ISO 14975 [1] and ISO 14976 (see Chapter 2) and international standards for microbeam analysis

ISO 22029 [2].

The main part of this standard includes the format description and relevant conventions. Appendix A describes the spatial geometry and type of scanner. Appendix B

A typical data acquisition geometry configuration is explained. Appendix C gives an example of a format with comments. Appendix D gives examples of data formats.

3.2 Elements of the Meta Language

The meta language consists of symbols that specify a series of rules to generate a sequence of linear characters. Only characters that match the rules can be inserted

To the sequence. The definition of the meta language should follow the ISO 14976 standard.

The symbols specified in the language are as follows.

* An integer followed by the number of occurrences of the event.

- Indicates that the foregoing terms are repeatable.

Separation of consecutive terms in a single definition.

| Separate the alternative single definitions in the definition list.

= Separates the definition list from the meta-identifiers defined by the format rules.