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Nanotechnologies — Nanoscale calcium carbonate in powder form — Characteristics and measurement

*Nanotechnologies — Carbonate de calcium à la nano-échelle sous
forme de poudre — Caractéristiques et mesurage*



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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO/TS 11931 was prepared by Technical Committee ISO/TC 229, *Nanotechnologies*.

Introduction

Calcium carbonate, CaCO_3 , is widely used in the paint, ink, building, paper, pharmaceutical and food industries. The applications of this material are expected to increase with the development of nanoscale calcium carbonate. Accordingly, there is a need to better define the characteristics of this material contributing to its performance. This Technical Specification provides methods to determine chemical composition of nanoscale calcium carbonate and three key parameters commonly used to characterize nanoscale calcium carbonate: average crystallite size, average primary particle size and specific surface area.

Calcium carbonate has crystalline structures: calcite, aragonite and vaterite. However, only calcite is widely used in commercial applications. Thus nanoscale calcium carbonate described in this Technical Specification has the calcite crystal structure.

There are two kinds of commercial nanoscale calcium carbonate: ground calcium carbonate (GCC) and precipitated calcium carbonate (PCC). These two products have different characteristics such as particle shape and particle size distribution. The buyer and seller should be aware of the different characteristics required for different applications.

X-ray diffraction (XRD) and transmission electron microscopy (TEM) methods are used to measure crystallite size and primary particle size, respectively. The Brunauer, Emmet and Teller (BET) method is used to measure specific surface area.

Nanotechnology is a rapidly growing and evolving field. Users of this document should maintain an awareness of the legislative environment and latest developments in Environmental Health and Safety regarding nanotechnology. These references may be of interest [1-12]. Responsibilities of users of this document include the following: the seller is obliged to provide the buyer with such environmental, health and safety information as required by law. If the seller or buyer wish to assess the environmental, safety or health risks of the material, they may refer to ISO/TR 12885:2008^[7] for further guidance.

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