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Determination of the silanol group content on the surface of fumed silica — Reaction gas chromatographic method

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Foreword

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This document was prepared by Technical Committee ISO/TC 256, *Pigments, dyestuffs and extenders*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Fumed silica (pyrogenic silicon dioxide) has a relatively high concentration of silanol groups formed during high-temperature flame hydrolysis and the following cooling process. This specified property enables fumed silica to be widely used as a reinforcing filler, thickener, thixotropy-increasing and anti-sagging additive in numerous industries, for example silicone rubber, coating materials, adhesives and sealants.

The determination of the silanol group content on the surface of fumed silica is essential for both manufacturers and users to develop a high-performance, surface modified fumed silica and improve existing products. Further, it also facilitates the communication among interested parties.

In practice, methods of titration, thermogravimetry (TG), infrared spectroscopy (IR) and reaction gas chromatography can be a choice for the determination of the silanol group content on the surface of fumed silica. Among these methods, the method of reaction gas chromatography is preferred by users due to the advantage of higher sensitivity and better reproducibility.

This document provides a detailed procedure for how to conduct the testing of the silanol group content on the surface of fumed silica by means of the reaction gas chromatographic method.