
Surface chemical analysis — Characterization of functional glass substrates for biosensing applications

*Analyse chimique des surfaces — Caractérisation de substrats de
verre fonctionnels pour les applications de biodétection*

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Foreword

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Introduction

Sensing devices based on immobilized biomolecules on solid substrates are a steadily growing market in personalized medicine and point of care (POC) diagnostics, which are becoming tremendously important for our society. Precise knowledge of these biointerfaces is a prerequisite for a reliable and proper functionality of such biosensing devices. This kind of knowledge includes surface composition, surface chemistry (e.g. functional groups, surface species), surface structure/morphology, in-depth compositional profiles and film thickness, which can be obtained by a thorough physico-chemical characterization using surface chemical analysis.

This report on surface chemical analysis of glass substrates for biosensors prepared by ISO/TC 201/WG 4 has been prepared in coordination with the overall characterization needs identified by experts in TC 201.

This document describes the information that can be obtained by the different analytical techniques and examines how this information can be used to understand and solve important questions and challenges in the biosensor production process.

With that focus, consideration of

- bulk composition;
- surface composition;
- cleanliness;
- wettability;
- reactivity; and
- stability

are relevant and (in an ideal case) should be known for each component, i.e. substrate, functional coating/layer and biomolecular probes, of a reliable biosensing device.

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