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CSA W207:20
National Standard of Canada

Kraft lignin — Determination of thermal stability by thermogravimetry

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Preface

This is the first edition of CSA W207, *Kraft lignin — Determination of thermal stability by thermogravimetry*.

This Standard was prepared by the Technical Committee for Lignin, under the jurisdiction of the Strategic Steering Committee on Natural Resources, and has been formally approved by the Technical Committee.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

Notes:

1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*
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0 Introduction

Lignin exists naturally in plants and trees and is one of the main components in wood. Given its abundance and its aromatic structure, lignin has the potential to replace fossil-based starting materials in a range of products including polymeric materials and fine chemicals. It is currently being evaluated by companies in Canada and around the world as an alternative to petroleum-based chemicals for products such as carbon fibres, flavour and pharmaceutical ingredients, resins, foams, rubber additives, and thermoplastics.

The majority of world commerce is governed by regulations-based product standards. An absence of standards for products and properties therefore limits market access. With international interest and ongoing work in developing and commercializing new products from lignin, a strong knowledge of the physicochemical properties of lignin including chemical structure, molecular weight distribution, and thermal properties is required.

Thermal stability is crucial when targeting applications where lignin and other materials are processed at high temperatures. The present method aims to provide Canadian producers with a standardized method to characterize the thermal stability of lignin in view of its use in applications requiring high temperatures. It will provide lignin producers and manufacturers with advantageous means to facilitate access to the domestic and global lignin and lignin derivatives marketplaces.

1 Scope

1.1

This Standard describes the thermal analysis of kraft lignin using thermogravimetric methods.

Thermogravimetry can be used to determine the initial decomposition temperature(s), rate(s) of decomposition, and the temperature at maximum decomposition of various materials, including lignins at atmospheric pressure. All these temperatures are solely based on the mass loss and are not necessarily the real decomposition temperatures, because not all decompositions can generate evaporation at atmospheric pressure. Thus, these values are only for comparison purposes.

This procedure is applicable to solid (e.g., powdered form) lignins isolated from the kraft pulping process. It does not apply to raw black liquor.

Thermogravimetric measurement may be performed under different types of atmosphere, e.g., an inert atmosphere or an oxidative atmosphere.

1.2

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that