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**Test method for the determination of total fluorine in
biodegradable materials and plastics**

生物基材料与降解塑料中总氟含量测定试验方法

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1. Structure and drafting rules for standardization documents" Drafting. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed and coordinated by the National Technical Committee for Standardization of Bio-based Materials and Degradable Products (SAC/TC380). This document was drafted by: Beijing Technology and Business University, Hefei Hengxin Life Science and Technology Co., Ltd., Ningbo Jialian Technology Co., Ltd., Fu Ling Technology Co., Ltd., Beijing Microstructure Factory Biotechnology Co., Ltd., Zhejiang Hisun Biomaterials Co., Ltd., Shenzhen Guanghuawei Industry Co., Ltd., Huitong Beigong Biotechnology (Beijing) Co., Ltd., Beijing Huancheng Technology Co., Ltd., Zhejiang Huafa Ecological Technology Co., Ltd. Company, Red Avenue Chemical (China) Co., Ltd., Huizhou Juner Plastic Technology Co., Ltd., Anhui Fengyuan Biotechnology Co., Ltd., Yangzhou Hui Tong Technology Co., Ltd., Guangdong Chongxi Environmental Protection Technology Co., Ltd., Chongqing Lianfa Plastic Technology Co., Ltd., Nanjing Wurui Biological Degradable New Materials Research Institute Co., Ltd., Shenzhen Wandajie Environmental Protection New Materials Co., Ltd., Anhui Huachi Environmental Protection Technology Co., Ltd., Yangzhou Huitong Bio-New Materials Co., Ltd., Anhui Hengxin Environmental Protection New Materials Co., Ltd., Sichuan University, Shenzhen Zhongjing Kelin Environmental Protection Plastic Technology Co., Ltd. Co., Ltd., Shenzhen Zhengwang Environmental Protection New Materials Co., Ltd., Jiangxi Xuanpin New Materials Co., Ltd., Yingkou Zhengda Industrial Co., Ltd., Pulisisheng Technology Co., Ltd., COFCO Biomaterials (Yushu) Co., Ltd., Jindan Bio-New Materials Co., Ltd., Shouguang Jinyuandong Modified Starch Co., Ltd. Company, Henan Longdu Tianren Biomaterials Co., Ltd., Sinopec (Dalian) Petrochemical Research Institute Co., Ltd., Light Industry Plastics Processing Application graduate School. The main drafters of this document are. Weng Yunxuan, Li Ziyi, Diao Xiaoqian, Yan Deping, Wang Xiong, Hu Xinfu, Xu Xuanming, Chen Zhiming, Yang Yihu, Chen Rui, Jiang Suchen, Feng Tao, Wang

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1 Scope

China's national test method for total fluorine in biodegradable materials and plastics. The measurement is a screen for PFAS - the per- and polyfluoroalkyl substances whose regulation has moved rapidly in every major market. Testing for the individual compounds is expensive and can only find the ones a method targets, while the class contains thousands; measuring total fluorine catches all of them at once, because organic fluorine essentially does not occur except where it has been put deliberately. The application to biodegradable materials is pointed. Compostable food packaging has been a significant source of PFAS, used as a grease barrier in moulded fibre bowls and wrappers, and the result was that the material composted into the soil taking the fluorochemicals with it - the opposite of what the product was bought for. A total fluorine screen is how that is detected.

This document describes the test principle, reagents and instrumentation for the determination of total fluorine content in bio-based materials and degraded plastics by high temperature hydrolysis-ion chromatography. Instruments, equipment, test methods, result calculations and test reports. This document is applicable to the determination of plastics or plastic products with a fluorine content ≥ 5 mg/kg.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 6682 Specifications and test methods for water used in analytical laboratories

GB/T 34672 General rules for determination of chemical reagents by ion chromatography
HJ/T

84 Water quality-Determination of inorganic anions-Ion chromatography

3 Terms and Definitions

There are no terms or definitions that require definition in this document.

4 Principles

Bio-based materials and degradable plastics and their products are calcined at high temperature in a tubular electric furnace. The samples are cracked and the cracked products are absorbed by water. All the fluorine contained in the solution is converted into fluoride and quantitatively dissolved in water. The fluoride ion concentration in the sample solution is determined by ion chromatography to calculate the biobased Fluorine content in materials and degradable plastic materials and their products.

5 Reagents and instruments

5.1 Water. in accordance with GB/T 6682, meeting the requirements of Grade 2 or above.

5.2 Oxygen. purity above 99.5%.

5.3 Combustion aid (optional). such as fluorine-free spectrum coal.

5.4 Iron (III) phosphate (optional). granular.

5.5 Quartz sand. particle size is 0.5mm~1.0mm.

5.6 Fluorine standard solution. Select an appropriate standard solution, such as 1.00 µg/g. Or prepare a 100 mg/L fluorine standard stock solution and weigh 0.2210 g of high-grade pure sodium fluoride dried at 120 ° C for 3 hours was placed in a beaker and dissolved in water. The solution was washed with water and added to a 1000 mL volumetric flask and diluted. Add to the scale, shake well and store in a clean polyethylene plastic bottle for later use.

5.7 Sodium fluoride (super pure).

5.8 Fluorine standard working solution. According to the requirements of HJ/T 84, prepare

0.002 mg/L,

0.005 mg/L,