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Ambient air - Report on nitro- and oxy-PAHs - Origin, toxicity, concentrations and measurement methods

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TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

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English Version

Ambient air - Report on nitro- and oxy-PAHs - Origin, toxicity, concentrations and measurement methods

Air ambiant - Rapport sur les nitro- et oxy-HAP - Origine, toxicité, concentrations et méthodes de mesure

Außenluft - Bericht über Nitro- und Oxy-PAHs - Herkunft, Toxizität, Konzentrationen und Messverfahren

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European foreword

This document (CEN/TR 16998:2016) has been prepared by Technical Committee CEN/TC 264 “Air quality”, the secretariat of which is held by DIN.

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Introduction

Nitro-PAHs and oxy-PAHs are found in ambient air samples and there are strong indications that they are as harmful as PAHS. Several compounds are classified as probably carcinogenic for humans (see Table in Annex A) and nitro-PAHs are reported to be strongly mutagenic. Photooxidation of volatile PAHs gives rise to the formation of secondary aerosols (Chan et al. 2009, Kautzman et al. 2010, Shakya and Griffin, 2010).

1-Nitropyrene and 2-nitrofluorene are discussed as marker compounds for diesel exhaust and other combustion processes. 2-Nitropyrene and 2-nitrofluoranthene are good marker substances for the formation of nitro-PAHs by secondary reactions.

This Technical Report presents the state of the art of the oxy- and nitro-PAHS topics.

1 Scope

This Technical Report is focused on the presence of nitro- and oxy-PAHs in ambient air. It describes how nitro- and oxy-PAH are formed, what typical concentrations are found, what is known about their toxicity, and what sampling and measurement techniques are available.

The conclusions of this report are that nitro- and oxy-PAHs concentrations are present in the atmosphere in levels that are of concern regarding their high toxicity. Information on the presence of these compounds in ambient air is as relevant as information about PAHs. Validated techniques for the measurement of nitro- and oxy-PAHs are available.

2 Symbols and abbreviations