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Full name and position of presenting author: Marina Ricci, Scientific Officer

Email address: marina.ricci@ec.europa.eu

Affiliation: European commission, Joint Research Center (JRC)

Address: Retieseweg 111, 2440 Geel

Phone number: 0032 14 571962

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**CERTIFICATION OF THE FIRST FISH REFERENCE MATERIAL FOR SCCPs**

Ricci M1, de Boer J2, Johansen JE3, Liu H3, Button J3, van Mourik LM2

**AUTHOR(S)** Include author(s) and co-author(s) full name, affiliation and address.

1Joint Research Center (JRC), European Commission, Geel, Belgium, 2440

2Environment and Health (E&H), Vrije Universiteit, Amsterdam, The Netherlands, 1081HV

3Chiron AS, Trondheim, Norway, 7491

**ABSTRACT** (350 words max.)

Introduction: The certification of the first fish reference material (RM) for the mass fraction of short-chain chlorinated paraffins (SCCPs) is presented. Despite having been the subject of environmental attention for decades [1], SCCPs analysis has not yet reached a sufficient degree of accuracy [2]. This study is part of the Eurostars project Chloffin which aims at reducing the uncertainty of CPs quantification by producing pure substance and matrix certified reference materials (CRMs) and by optimising and validating methods of analysis [3].

Materials and Methods: The certification was performed in accordance to ISO 17034:2016 and ISO Guide 35:2017 [4]. The material was characterised by an intercomparison of laboratories of demonstrated competence, adhering to ISO/IEC 17025:2017 [5], and applying different analytical procedures. The characterisation study included the analysis of a calibration quality control sample (CQC, mixture of single chain SCCPs mixtures) and a method quality control (MQC, Lake superior fish tissue NIST SRM 1946) together with the candidate CRM for SCCPs, ERM-CE100.

Results and Discussion: The SCCPs certification was performed on ERM-CE100, a fish tissue CRM already available by the JRC [6]. Homogeneity, short- and long-term stability of the material were confirmed, resulting in acceptable standard uncertainties equal to 3.2 %, 2.8 % and 6.7 %, respectively. The participants to the characterisation study were requested to submit results for total SCCPs and additionally for ΣC10-13Cl6 SCCPs congeners using an ad-hoc purity-assessed common calibrant. The ten received datasets were further “validated” using the CQC and MQC before their inclusion in the value assignment of the ERM. This led to the exclusion of some of the results, confirming the struggle in the quality control of SCCPs determination. The assigned value for total SCCPs in ERM-CE100 lays around 30 µg/kg (wet weight) with an expanded uncertainty of about 30 %, including the biggest uncertainty contribution due, as expected, to the characterisation step.

Conclusion: The certification of ERM-CE100 for SCCPs was overall a successful exercise, leading to the first matrix RM with an assigned value for these analytically challenging pollutants. The assigned value includes results obtained by GC and LC-based analytical methodologies coupled with different MS detectors. The lessons learned during this study deepen the understanding and bring the comparability of SCCPs analysis a step forward.

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