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MEMO: Precision data of Phthalates in plastic July 2017

Proficiency tests for Phthalates in plastic have been organized by the Institute for Interlaboratory since 2001. Due to the lack of standard test methods for the determination of Phthalates in plastic, calculated reproducibilities were compared with reproducibilities estimated from the strict Horwitz equation ($RSD_R = 2 \times c^{-0.15}$) until 2007. Starting the 2008 PT iis18P01 the target reproducibility was estimated from the test method EN 14372:2004. Regretfully, only a relative within-laboratory standard deviation RSD_r is given in this Standard. Multiplication of the RSD_r by 3 gives the between-laboratory standard deviation RSD_R of 9%. This target variation of 9% was used in the PT evaluations from 2008 – 2015.

From 2008 - 2010 significant differences between the EN14372 results and the results from THF dissolution were observed. In the PTs of 2011 – 2014 this was no longer the case. In the proficiency tests from 2015 onwards, the majority of laboratories used THF as extraction solvent. This will be caused by the issue of a new Standardized test method ISO 14389 in 2014. This test method contains 4 different procedures of which procedure 4, prescribes the extraction with THF followed by precipitation with Acetonitrile. In 2015 and 2016 a target variation of 11% was estimated from the data given in Annex D2 of ISO14389:2014.

However, from the overview in table 1 (next page) of the uncertainties RSD_R (in %) as observed since 2010, no quality improvement is visible over the years. Therefore it is doubtful whether the target variation based on ISO14389:2014 will ever be met. This goal may be unreachable.

Therefore it was now decided to use the iis PT data gathered since 2010, to estimate a more realistic target variation. The PT data in table 1 are from 8 PTs and 53 different data sets for 13 different Phthalates. From these data is visible that the relative variations of the subsequent PTs and the different Phthalates show large similarity.

For future PTs on Phthalates in plastic, starting the 2017 PT iis17P03, iis will use these data to estimate the target variation (RSD_R = 16%) to be used for the evaluation of the quality of the test results.

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	2017	*2016*	*2015*	*2014*	*2013*	*2012*	*2011*	*2010*
DINP	31	19	--	20	20	26	12 – 17	--
DBP	16 – 17	12	15	17	14	11 – 16	17	14
DEHP	17 – 29	13 – 13	13	17 – 19	--	13 – 18	12 – 13	--
BBP	--	13	--	12	13	11	13 – 15	14
DIDP	--	--	17	20	19	--	15	--
DNOP	--	18	23	21	--	20	15	--
DHP	--	--	--	--	--	--	11	--
DiBP	--	--	14	--	--	--	--	--
DEP	--	--	13	--	--	--	--	--
DNPP	16	--	15	--	--	--	--	--
DCHP	--	--	16	--	--	--	--	--
DMP	--	12	--	--	--	--	--	--
DNHP	17	--	--	--	--	--	--	--

Table1: variation as RSD_R in % from 2010 - 2017