HIDEX

Lowest limit of detection for Hidex 300 SL super low level TDCR counter according to the Council Directive 013/51/EURATOM

The table is listing radioactive substances typically counted from environmental water samples using LSC method.
Also other beta and alpha isotopes listed in the Directive ANNEX III.3. can be measured using proper sample preparation chemistry followed by LSC.
Low Ld requirements for gamma isotopes such as Cs-137 requires the use of other type of detector such as large volume HPGe or NaI detectors.
Parametric values, screening level and Ld requirement refer to Radioactive substances in water intended for human consumption
according to the Council Directive 013/51/EURATOM (ANNEX II.3.). The limit of detection is calculated according to the ISO standard 11929.

Radioactive substance	*Parametric value*	*Screening level*	*Ld requirement*	*Ld*	*Description of the method*
H-3	100 Bq/L		10 Bq/L	< 9 Bq/L	Direct measurement from water: 8 ml sample + 12 ml AquaLight ultra low level cocktail in 20 ml teflon coated plastic vial in fully open counting window for H-3 in water. Measurement time 60 min, k1-a + k 1-b = 3.92. Note! Data obtained by using luminescence free counting mode (no luminescence interference in the results), allowing also the start of counting immediately after sample preparation.
C-14			20 Bq/L	< 15 Bq/L	Direct measurement from water: 8 ml sample + 12 ml AquaLight ultra low level cocktail in 20 ml teflon coated plastic vial in fully open counting window for C-14 in water. Measurement time 10 min, k1-a + k 1-b = 3.92.
Gross alpha		0.1 Bq/L	0.04 Bq/L	< 0.04 Bq/L	Concentration of the sample to 1:10 by evaporation: 8 ml concentrated sample + 12 ml AquaLight coktail in 20 ml teflon coated plastic vial in open alpha energy window using alpha beta separation option. Measurement time 500 min, k1-a + k 1-b = 3.92. Counting simultaneously with gross beta.
Gross beta		1.0 Bq/L	0.42Bq/L	< 0.2 Bq/L	Concentration of the sample to 1:10 by evaporation: 8 ml concentrated sample + 12 ml AquaLight coktail in 20 ml teflon coated plastic vial in open alpha energy window using alpha beta separation option. Measurement time 500 min, k1-a + k 1-b = 3.92. Counting simultaneously with gross alpha.
Sr-90			0.4 Bq/L	< 0.2 Bq/L	Direct counting after radiochemical separation: 8 ml of prepared water sample in Cerenkov-TDCR counting mode in 20 ml plastic vial for Y-90 activity. Subsequent addition of 12 ml of AquLight Beta cocktail to count Y-90 + Sr-90 activity on LSC mode. Sample volume 2 L, measurement time 30 min, k1-a + k 1-b = 3.92.
Rn-222	100 Bq/L		10 Bq/L	< 2 Bq/L	Direct measurement of the sample after extraction of Rn-222 from 10 ml of water using 10 ml of extractive MaxiLight cocktail in 20 mL teflon coated plastic vial. Measurement time 5 min, k1-a + k 1-b = 3.92.

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