Biocidal Products Committee (BPC)

Opinion on the application for approval of the active substance:

Alkyl (C12-16) dimethylbenzyl ammonium chloride

Product type: 1

ECHA/BPC/309/2021

Adopted

2 December 2021

Opinion of the Biocidal Products Committee

on the application for approval of the active substance alkyl (C12-16) dimethylbenzyl ammonium chloride for product type 1

In accordance with Article 89(1) of Regulation (EU) No 528/2012 of the European Parliament and of the Council 22 May 2012 concerning the making available on the market and use of biocidal products (BPR), the Biocidal Products Committee (BPC) has adopted this opinion on the approval in product type 1 of the following active substance:

Common name:	**Alkyl (C12-16) dimethylbenzyl ammoniumchloride**
Chemical name:	**Not applicable**
EC No.:	**270-325-2**
CAS No.:	**68424-85-1**

Existing active substance

This document presents the opinion adopted by the BPC, having regard to the conclusions of the evaluating Competent Authority. The assessment report, as a supporting document to the opinion, contains the detailed grounds for the opinion.

Process for the adoption of the BPC opinion

Following the submission of two separate applications by Lonza AG & Stepan Europe & Mason Europe Ltd (US ADBAC Issues Steering Committee, US ISC) and by Nouryon, Thor and Innospec (European Quat Consortium, EQC) on 31 July 2007, the evaluating Competent Authority Italy submitted an assessment report and the conclusions of its evaluation to the Commission on 10 September 2012. In order to review the assessment report and the conclusions of the evaluating Competent Authority, the Agency organised consultations via the BPC (BPC-41) and its Working Groups (WG III 2021). Revisions agreed upon were presented and the assessment report and the conclusions were amended accordingly.

Adoption of the BPC opinion

Rapporteur: Italy

The BPC opinion on the application for approval of the active substance alkyl (C12-16) dimethylbenzyl ammonium chloride in product type 1 was adopted on 2 December 2021.

The BPC opinion was adopted by consensus.

The opinion is published on the ECHA webpage at: http://echa.europa.eu/regulations/biocidal-products-regulation/approval-of-active-substances/bpc-opinions-on-active-substance-approval.

Detailed BPC opinion and background

1. Overall conclusion

The overall conclusion of the BPC is that the alkyl (C12-16) dimethylbenzyl ammonium chloride in product type 1 may be approved. The detailed grounds for the overall conclusion are described in the assessment report.

2. BPC Opinion

2.1. BPC Conclusions of the evaluation

a) Presentation of the active substance including the classification and labelling of the active substance

This evaluation covers the use of alkyl (C12-16) dimethylbenzyl ammonium chloride in product type 1. The active substance is already approved for product types 8 (Directive 2013/7/EU), 3 and 4 (Regulation 2021/1063/EU). Alkyl (C12-16) dimethylbenzyl ammonium chloride was notified as an existing active substance, separately by Lonza AG & Stepan Europe & Mason Europe Ltd (ADBAC Issues Steering Committee, US ISC) and Nouryon, Thor and Innospec (European Quat Consortium, EQC).

Alkyl (C12-16) dimethylbenzyl ammonium chloride is a cationic surfactant-type active substance, which is not manufactured solvent-free, but in process solvents as technical concentrate (in water or water/alcohol). Specifications for the reference source are established.

The physico-chemical properties of the active substance and biocidal products have been evaluated and are deemed acceptable for the appropriate use, storage and transportation of the active substance and biocidal products.

Validated analytical methods are available for the active substance as manufactured and for the significant impurities. Validated analytical methods are available for the relevant matrices soil and water.

A harmonised classification for the active substance according to Regulation (EC) No 1272/2008 (CLP Regulation) is currently not available.

The proposed classification and labelling for alkyl (C12-16) dimethylbenzyl ammonium chloride according to Regulation (EC) No 1272/2008 (CLP Regulation) is:

Classification according to the CLP Regulation	
Hazard Class and Category Codes	Acute Tox. 4 Skin Corr. 1B Eye Dam. 1 STOT SE 3 Aquatic Acute 1 Aquatic Chronic 1

	H302 H314 H318 H335 H400 H410
Labelling	
Pictogram Codes	GHS05, GHS07, GHS09
Signal Word	Danger
Hazard Statement Codes	H302: Harmful if swallowed. H314: Causes severe skin burns and eye damage. H335: May cause respiratory irritation. H410: Very toxic to aquatic life with long lasting effects.
Specific Concentration limits, M-Factors	M factor=10 (Acute) M factor=1 (Chronic)
eCA's NOTE: The classification as Eye Dam. 1 H318 was not discussed for the PTs approved earlier. This additional classification has been assigned for PTs 1 and 2 according to the Guidance on application of CLP criteria (v.5.0, July 2017), Section 3.3.2.4.	

b) Intended use, target species and effectiveness

Alkyl (C12-16) dimethylbenzyl ammonium chloride is a broad-spectrum biocide intended to be used in PT1 in products for hand disinfection by non-professional and professional users. The in-use concentration can vary, depending on the area and circumstances, e.g. frequency of use, level of soiling etc. The tested efficacious concentration, covering minimum target spectrum, was 700 ppm.

Like other quaternary ammonium substances, alkyl (C12-16) dimethylbenzyl ammonium chloride is a membrane active agent targeting predominantly the cytoplasmic (inner) membrane in bacteria or the plasma membrane in yeasts and fungi, leading to membrane disorganization, followed by leakage of the intracellular substance with release of K^+ ions and other cytoplasmic constitutes, and precipitation of cell content leading to cell death.

Efficacy data, provided by both Applicants, have demonstrated innate efficacy of alkyl (C12-16) dimethylbenzyl ammonium chloride against the target organisms bacteria, yeasts and fungi. The studies performed are regarded as sufficient at the approval stage. Further data in accordance with the relevant guidance documents shall be provided in the scope of product authorisation.

Quaternary ammonium compounds have been in use for many years, with no indication that their efficacy is diminishing over time. Nevertheless, occasional increase in tolerance has been reported in the literature. Therefore, as the development of resistance is possible for such uses, at the stage of product authorization strategies of resistance management will be reviewed, if needed.

c) Overall conclusion of the evaluation including need for risk management measures

Human health

The main critical effects associated with alkyl (C12-16) dimethylbenzyl ammonium chloride are due to its corrosive properties. The active substance induces severe erythema, desquamation and corrosive eschar in the rabbit skin, and therefore it is classified as corrosive to skin. According to the available studies on toxicokinetics and metabolism as well as to the toxicity study package, no systemic effects in the absence of local effects were observed in any of those studies. Therefore, only a local risk assessment was considered necessary for the use of alkyl (C12-16) dimethylbenzyl ammonium chloride. To this aim, the local risk assessment has been performed applying the read-across principles from data presented for didecyldimethylammonium chloride (DDAC), a structurally related quaternary ammonium compound.

The table below summarises the exposure scenarios assessed.

Summary table: human health scenarios			
Scenario	**Primary or secondary exposure and description of scenario**	**Exposed group**	**Conclusion**
Hand disinfection using hand wash	Primary exposure: Hand disinfection by hand washing The product is a RTU water-based formulation used for hand disinfection by hand washing in public and private healthcare settings, food processing industry and private homes. The in-use concentration range is 0.1%-0.3% w/w of alkyl (C12-16) dimethylbenzyl ammonium chloride.	Professional users Non-Professional users	Acceptable
Hand disinfection using hand wash	Primary exposure: Hand disinfection by hand washing The product is a RTU water-based formulation used for hand disinfection by hand washing in the health care areas. The in-use concentration is 0.3% w/w of alkyl (C12-16) dimethylbenzyl ammonium chloride.	Professional users	Acceptable

The in-use concentrations in the RTU products do not trigger any classification for local effects, therefore no qualitative local risk assessment has been performed for inhalation and dermal route. Nevertheless, for primary exposure a semi-quantitative local risk assessment has been conducted for the dermal route, only. No exposure is expected via inhalation route due the low volatility of the active substance and the application method of the RTU product. The oral route is considered to be negligible.

In conclusion, no unacceptable risk is highlighted due to the direct applications of the RTU product.

The secondary exposure for professional users is not foreseen. As for non-professional users, although accidental exposure *via* hand-to-mouth transfer of the product may occur (particularly in the case of children), it would be minimal. Considering the intended use also in the food processing industry, there is the possibility that part of the a.s., which may remain on the skin after rinsing, may be transferred from treated hands onto food items and be ingested. Consequently, consumer exposure via uptake of residues in food cannot be excluded. However, as no relevant guidance is available so far, the dietary risk assessment should be postponed to the product authorization level. When relevant guidance is made available, it should be considered for product authorization.

Environment

Alkyl (C12-16) dimethylbenzyl ammonium chloride is readily biodegradable, and the substance is not persistent. The substance is hydrolytically stable, and hydrolytic processes do not contribute to its degradation in the environment, it is neither volatile nor is it expected to be present in the air. Alkyl (C12-16) dimethylbenzyl ammonium chloride can be considered immobile in soil and its degradation in soil has been demonstrated by a soil degradation study (OECD 307) carried out on the active substance. Regarding metabolites, it has been evaluated that the toxicity of the parent covers the toxicity of the metabolite(s), i.e., the maximum concentration of metabolite(s) in soil will not exceed initial concentration of parent at any time. The potential for bioaccumulation is low.

The sensitivity ranking of aquatic pelagic organisms to alkyl (C12-16) dimethylbenzyl ammonium chloride is *D. magna* >≈ algae > fish, hence the risk assessment to the aquatic compartment is driven by the chronic toxicity to invertebrates. For the organisms in sediment compartment, the PNEC derived with the EPM method is used in the risk assessment, as being more conservative than that derived experimentally.

The soil characteristics influence the toxicity of the active to terrestrial organisms by modulating its bioavailability. The chronic toxicity to microorganisms (most sensitive organisms in acute tests) drives the risk assessment.

The evaluation of secondary poisoning via aquatic food chain is based on short-term dietary toxicity data on birds, a 52 weeks sub-chronic study with dogs retrieved from the human health section and the fish experimental BCF.

Product PT 1 is used as hand disinfectant for human hygiene purposes by professionals and non-professionals. Typical use of the product involves hand washing in several sectors. In all cases, hands are rinsed after use. For such use conditions, it is considered that the only relevant environmental exposure is via emission to drains and STP after use. This exposure scenario is taken to represent a worst-case in terms of exposure to the environment.

The table below summarises the exposure scenarios assessed.

Summary table: environment scenarios		
Scenario	**Description of scenario including environmental compartments**	**Conclusion**
Hand disinfection using hand wash Professional and non-professional users	Hand washing in public and private healthcare settings, food processing industry and private homes. In all cases, hands are rinsed after use. Environmental compartments: STP, surface water, sediment and soil	Acceptable for all compartments using the consumption and tonnage based (based on the individual and combined tonnages of both applicants) approach.

Following the uses of alkyl (C12-16) dimethylbenzyl ammonium chloride, for the aquatic compartment (STP, surface water and sediment) PEC/PNEC ratios are less than one, demonstrating that the risks to aquatic organisms and to the functioning of sewage treatment plants, following the uses of of the active substance, are acceptable.

The terrestrial compartment PEC/PNEC ratios for uses of alkyl (C12-16) dimethylbenzyl ammonium chloride in human hygiene area (PT 1) are less than one, demonstrating that the risk to soil organisms is acceptable.

Overall conclusion

For human health, an acceptable risk was identified for the scenario “Hand disinfection using hand wash” for both professional and non-professional users.

For the environment, acceptable risks were identified for the professional and non-professional scenarios of hand disinfection using hand wash.

In conclusion, safe uses covering both the human health and the environment have been identified.

2.2. Exclusion, substitution and POP criteria

2.2.1. Exclusion and substitution criteria

The table below summarises the relevant information with respect to the assessment of exclusion and substitution criteria:

Property		Conclusions	
CMR properties	Carcinogenicity (C)	No classification required	Alkyl (C12-16) dimethylbenzyl ammonium chloride does not fulfil criterion (a), (b) and (c) of Article 5(1)
	Mutagenicity (M)	No classification required	
	Toxic for reproduction (R)	No classification required	
PBT and vPvB properties	Persistent (P) or very Persistent (vP)	Not P	Alkyl (C12-16) dimethylbenzyl ammonium chloride does not fulfil criterion (e) of Article 5(1)
	Bioaccumulative (B) or very Bioaccumulative (vB)	Not B	

Property		Conclusions	
	Toxic (T)	T	and does not fulfil criterion (d) of Article 10(1)
Endocrine disrupting properties	Section A of Regulation (EU) 2017/2100: ED properties with respect to humans	No	Alkyl (C12-16) dimethylbenzyl ammonium chloride does not fulfil criterion (d) of Article 5(1)
	Section B of Regulation (EU) 2017/2100: ED properties with respect to non-target organisms	No conclusion can be drawn based on the available data	No conclusion can be drawn whether alkyl (C12-16) dimethylbenzyl ammonium chloride fulfils criterion (e) of Article 10(1)
	Article 57(f) and 59(1) of REACH	No	
	Intended mode of action that consists of controlling target organisms via their endocrine system(s)	No	
Respiratory sensitisation properties	Alkyl (C12-16) dimethylbenzyl ammonium chloride does not fulfil criterion (b) of Article 10(1)		
Concerns linked to critical effects other than those related to endocrine disrupting properties	Alkyl (C12-16) dimethylbenzyl ammonium chloride does not fulfil criterion (e) of Article 10(1)		
Proportion of non-active isomers or impurities	As the proportion of impurities is below 20%, alkyl (C12-16) dimethylbenzyl ammonium chloride does not fulfil criterion (f) of Article 10(1)		

Consequently, the following is concluded: alkyl (C12-16) dimethylbenzyl ammonium chloride does not meet the exclusion criteria laid down in Article 5 of Regulation (EU) No 528/2012. Alkyl (C12-16) dimethylbenzyl ammonium chloride does not meet the conditions laid down in Article 10 of Regulation (EU) No 528/2012 and is therefore not considered as a candidate for substitution.

The exclusion and substitution criteria were assessed in line with the "Note on the principles for taking decisions on the approval of active substances under the BPR"[1] and in line with "Further guidance on the application of the substitution criteria set out under Article 10(1) of the BPR"[2] and with "Implementation of scientific criteria to determine the endocrine-disrupting properties of active substances currently under assessment"[3] agreed at the 54th,

[1] See document: Note on the principles for taking decisions on the approval of active substances under the BPR (available from https://circabc.europa.eu/d/a/workspace/SpacesStore/c41b4ad4-356c-4852-9512-62e72cc919df/CA-March14-Doc.4.1%20-%20Final%20-%20Principles%20for%20substance%20approval.doc)
[2] See document: Further guidance on the application of the substitution criteria set out under article 10(1) of the BPR (available from https://circabc.europa.eu/d/a/workspace/SpacesStore/dbac71e3-cd70-4ed7-bd40-fc1cb92cfe1c/CA-Nov14-Doc.4.4%20-%20Final%20-%20Further%20guidance%20on%20Art10(1).doc)
[3] See document: Implementation of scientific criteria to determine the endocrine –disrupting properties of active substances currently under assessment (https://circabc.europa.eu/sd/a/48320db7-fc33-4a91-

58th and 77th meeting respectively, of the representatives of Member States Competent Authorities for the implementation of Regulation 528/2012 concerning the making available on the market and use of biocidal products. This implies that the assessment of the exclusion criteria is based on Article 5(1) and the assessment of substitution criteria is based on Article 10(1)(a, b, d, e and f).

For the endocrine-disrupting properties as defined in Regulation (EU) No 2017/2100, properties of alkyl (C12-16) dimethylbenzyl ammonium chloride have been sufficiently investigated and based on the available evidence, the substance does not meet the ED criteria for human health according to the criteria laid down in Regulation (EU) No 2017/2100. With respect to non-target organisms, in relation to the criteria set out in section B of Regulation (EU) No 2017/2100 no conclusion can be drawn based on the available data. For reports submitted before 1 September 2013, it is mentioned in the CA meeting note mentioned above that the evaluating Competent Authority has to conclude based on the already available data and/or the data provided by the applicant and, in case the data is insufficient to reach a conclusion, the BPC may conclude in its opinion that no conclusion could be drawn. It is noted that the evaluation of alkyl (C12-16) dimethylbenzyl ammonium chloride for PT 1 was submitted before 1 September 2013.

2.2.2. POP criteria

Alkyl (C12-16) dimethylbenzyl ammonium chloride does not meet the PBT criteria. No potential for long-range environmental transport is expected, either. Subsequently, it is concluded that alkyl (C12-16) dimethylbenzyl ammonium chloride is not expected to meet the POP criteria.

2.3. BPC opinion on the application for approval of the active substance alkyl (C12-16) dimethylbenzyl ammonium chloride in product type 1

In view of the conclusions of the evaluation, it is proposed that alkyl (C12-16) dimethylbenzyl ammonium chloride shall be approved and be included in the Union list of approved active substances, subject to the following specific conditions:

1. Specification: minimum purity of the active substance evaluated: 972 g/kg dry weight
2. The authorisations of biocidal products are subject to the following condition(s):
    a. The product assessment shall pay particular attention to the exposures, the risks and the efficacy linked to any uses covered by an application for authorisation, but not addressed in the Union level risk assessment of the active substance.

Alkyl (C12-16) dimethylbenzyl ammonium chloride meets the criteria for classification according to Regulation (EC) 1272/2008 as skin corrosive of category 1B, specific target organ toxicant – single exposure, category 3 and toxic to aquatic life of acute category 1. The active substance does not fulfil the criteria according to Article 28(2)(a) to enable inclusion in Annex I of Regulation (EU) 528/2012.

2.4. Elements to be taken into account when authorising products

1. The following recommendations and risk mitigation measures have been identified for

the uses assessed. Authorities should consider these risk mitigation measures when authorising products, together with possible other risk mitigation measures, and decide whether these measures are applicable for the concerned product:

a. A dietary risk assessment may be required at the product authorisation level when the use of the product may lead to food contamination.

b. For products that may lead to residues in food or feed, the need to set new or to amend existing maximum residue levels (MRLs) in accordance with Regulation (EC) No 470/2009[4] or Regulation (EC) No 396/2005[5] shall be verified, and any appropriate risk mitigation measures shall be taken to ensure that the applicable MRLs are not exceeded.

2.5. Requirement for further information

Sufficient data have been provided to verify the conclusions on the active substance, permitting the proposal for the approval of alkyl (C12-16) dimethylbenzyl ammonium chloride.

o0o

[4] Regulation (EC) No 470/2009 of the European Parliament and of the Council (OJ L 152, 16.6.2009, p. 11)
[5] Regulation (EC) No 396/2005 of the European Parliament and of the Council (OJ L 70, 16.3.2005, p. 1)