Assessment of regulatory needs

Authority: European Chemicals Agency (ECHA)

Group Name: Aziridines

General structure:

where: R = acyl, amide sequence or alkyl substituted with various functional groups; R1 = alkyl or alkyl substituted with various functional groups

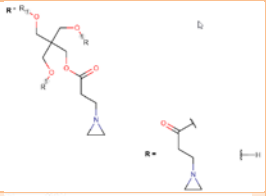
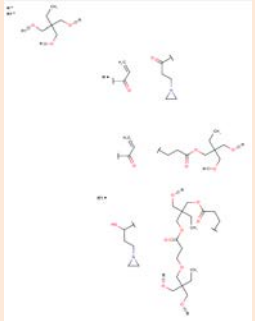
Revision history

Version	*Date*	*Description*
1.0	12 August 2024	

Substances within this group:

EC / List no	CAS no	Substance name	Chemical structures	Registration type (full, OSII or TII, NONS, cease manufacture), highest tonnage band among all the registrations (t/y) [1]
205-793-9	151-56-4	aziridine		Full, >1000
200-878-7	75-55-8	2-methylaziridine		OSII or TII
214-009-4	1072-52-2	2-(aziridin-1-yl)ethanol		C&L notification
278-047-3	74993-03-6	3-(aziridin-1-yl)butan-1-amine		OSII or TII
257-765-0	52234-82-9	2-[(3-aziridin-1-ylpropionyl)methyl]-2-ethylpropane-1,3-diyl bis(aziridine-1-propionate)		Cease manufacture
260-568-2	57116-45-7	2-({[3-(aziridin-1-yl)propanoyl]oxy}methyl)-2-(hydroxymethyl)propane-1,3-diyl bis[3-(aziridin-1-yl)propanoate]		C&L notification
231-617-5	7652-64-4	1,3-phenylenebis[(2-methylaziridin-1-yl)methanone]		Full, 1-10

[1]The total aggregated tonnage band may be available on ECHA's webpage at https://echa.europa.eu/information-on-chemicals/registered-substances

EC / List no	CAS no	Substance name	Chemical structures	Registration type (full, OSII or TII, NONS, cease manufacture), highest tonnage band among all the registrations (t/y) [1]
231-034-6	7417-99-4	*N*,*N*'-(methylenedi-4,1-phenylene)diaziridine-1-carboxamide		Full, 10-100
939-180-9	-	Reaction mass of 2,2-bis({[3-(2-methylaziridin-1-yl)propanoyl]oxy}methyl)butyl 3-(2-methylaziridin-1-yl)propanoate and 2,2-bis({[3-(2-methylaziridin-1-yl)propanoyl]oxy}methyl)butyl 3-[2,2-bis({[3-(2-methylaziridin-1-yl)propanoyl]oxy}methyl)butoxy]propanoate		Full, 100-1000
939-338-7	-	Reaction products of [chemical names of starting materials]		Full, 100-1000
953-703-8	-	Reaction products of aziridine and 2-ethyl-2-[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate		Full, 1-10
208-892-5	545-55-1	tri(aziridin-1-yl)phosphine oxide	P	Not registered
285-331-0	85068-72-0	*N*-methyl-*P*,*P*-bis[(2-methylaziridin-1-yl)]phosphinic amide	O	Full, 1-10

EC / List no	CAS no	Substance name	Chemical structures	Registration type (full, OSII or TII, NONS, cease manufacture), highest tonnage band among all the registrations (t/y) [1]
620-285-0	902146-43-4	(2S)-2-benzyl-N,N-dimethylaziridine-1-sulfonamide	N	OSII or TII

This table contains also group members that are only notified under the CLP Regulation, however, the list is not necessarily exhaustive.

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Foreword

The assessment of regulatory needs of a group of substances is an iterative, informal process to help authorities consider the most appropriate way to address an identified concern for a group of substances or a single substance and decide whether further regulatory risk management activities are necessary.

The grouping is mainly based on structural similarity and associations made by the registrants between substances through read-across and category approaches as well as category associations from external sources (e.g. OECD categories)[2]. These methods are different from grouping as defined in Section 1.5 of Annex XI to REACH because the scope and intended use of ECHA's grouping is different. Thus, in this context, grouping does not aim to validate read-across and category approaches according to the Annex XI requirements but rather to support a faster and more consistent approach for regulating chemicals and avoid regrettable substitution.

The focus of the assessment is largely based on information available in the registration dossiers and on properties requiring regulatory risk management action at EU level[3]. The information reported on uses is from the registration dossiers (IUCLID) and is used as a proxy for assessing how widespread uses are and whether potential for exposure to humans and releases to the environment can be expected. The chemical safety reports are not necessarily consulted, and no quantitative exposure assessment is performed at this stage.

The outcome of these assessments are proposals for immediate (the first action) and subsequent regulatory action(s), including the foreseen ultimate regulatory action (last foreseen regulatory action) to address the identified concern(s) in case the potential hazards are confirmed. For example, further data generation through compliance check is suggested as a first action, to confirm the identified hazard.

Where hazards are confirmed, regulatory risk management actions could be considered for the whole group, for a subgroup or for individual substances within the group. The robustness of the group depends on the stage of assessment and the level of certainty this stage requires. For example, the needs for grouping under restriction may differ from the needs for grouping for the purpose of harmonised classification. Group membership is reconsidered accordingly throughout the iterative assessment of regulatory needs, for example, after further information is generated and the hazard has been clarified or when new insights on uses and risks are available.

The assessment of regulatory needs in itself does not represent a regulatory action, but rather a preparatory step to consider further possible regulatory actions at the level of individual substances or groups/subgroups of substances.

Publication of ARNs makes it easier for companies to follow the latest status of their substances of interest, anticipate potential regulatory actions and make strategic choices in their chemicals' portfolio.

[2] Working with Groups - ECHA (europa.eu)

[3] Regarding hazard properties the focus is for instance on CMR (carcinogenic, mutagenic and/or toxic to reproduction), sensitiser, ED (endocrine disruptor), PBT/vPvB or equivalent (e.g. substances being persistent, mobile and toxic), aquatic toxicity hazard endpoints and therefore only those are reflected in the report. This does not mean that the substances do not have other known or potential hazards. In some specific cases, ECHA may consider additional hazards (e.g. neurotoxicity, STOT RE).

For more information on assessments of regulatory needs please consult ECHA's website[4].

[4] https://echa.europa.eu/understanding-assessment-regulatory-needs

Glossary

ARN	Assessment of Regulatory Needs
CCH	Compliance Check
CLH	Harmonised classification and labelling
CMR	Carcinogenic, mutagenic and/or toxic to reproduction
DEv	Dossier evaluation
ED	Endocrine disruptor
NONS	Notified new substances
OEL	Occupational exposure limit
OSII or TII	On-site isolated intermediate or transported isolated intermediate
PBT/vPvB	Persistent, bioaccumulative and toxic / very persistent and very bioaccumulative
PMT/vPvM	Persistent, mobile, and toxic / very persistent and very mobile
RDT	Repeated dose toxicity
RMOA	Regulatory management options analysis
RRM	Regulatory risk management
SEv	Substance evaluation
STOT RE	Specific target organ toxicity, repeated exposure
SVHC	Substance of very high concern
TPE	Testing proposal evaluation

1 Overview of the group

Explanations on the scope of this assessment is available in the foreword to this document. Please read it carefully before going through the report.

ECHA has grouped together **14** structurally similar substances based on the presence of a substituted aziridine ring, as shown in the figure below:

where: R = acyl, amide sequence or alkyl substituted with various functional groups; R1 = alkyl or alkyl substituted with various functional groups

The registration status of the substances is the following: **7** full (Article 10) registrations, **3** intermediate registrations. Additionally, **3** substances are not registered (or C&L notifications exist), and **1** registration is inactive.

Based on information reported in the REACH registration dossiers, for most of the substances with full registrations the same uses are reported. These substances are used mainly as precursors and crosslinking agents in adhesives and sealants, coatings and paints, textile dyes and leather treatment products.

For two substances, EC 231-034-6 and List 939-180-9, uses are reported for both professional and industrial workers with also articles service life indicated, whereas for three substances, EC/List 231-617-5, 953-703-8 and 939-338-7, only uses by industrial workers are reported. For worker activities such as roller application, brushing and spraying there is clear potential for exposure of both professionals and industrial workers. Due to the similar chemical properties and uses, there is also a potential for substitution for most of the substance.

Three substances, EC 200-878-7, 205-793-9 and 257-765-0, have been prohibited to be used in cosmetics[5], EC 205-793-9 has also been restricted for some uses under the Food Contact Material (FCM) regulation. For one substance (EC 285-331-0) only limited information on its use is provided, however it is indicated to be used as an adhesion promoter in the manufacture of machine and vehicles and the production of articles.

Aziridine (EC 205-793-9) with full registration differs from the others in its use pattern in that only industrial use as pharmaceuticals, laboratory chemical and as intermediate is reported in its registration dossier. Aziridine (EC 205-793-9) has a known hazard for mutagenicity and carcinogenicity with CLH as Muta. 1B and Carc. 1B, also 2-methylaziridine (EC 200-878-7, intermediate registration only) has a CLH for Carc. 1B. For both Aziridine (EC 205-793-9) and 2-methylaziridine (EC 200-878-7 there are also national OELs available in several Member States as well as outside Europe. As fully discussed in the following sections due to the common structural feature, the aziridine moiety, its known hazard concerns are extrapolated to all members of the group.

[5] EU. Prohibited Substances: Annex II, Regulation 1223/2009/EC on Cosmetic Products, as amended by Regulation (EU) 2024/996, OJ L of 4 April 2024

EC231-034-6, has earlier been assessed in another group, the Methylenediphenylureas[6], where CLH for mutagenicity followed by restriction/authorisation/OEL were indicated as potential RRM actions. However a compliance check (CCH) was required first to clarify the mutagenicity hazard. While the data generation has not yet been fully completed, some findings are presented in section 3 of this report.

[6] GMT_192_Methylendiphenylureas_report_public.pdf

2 Conclusions and proposed actions

The conclusions and actions proposed in the table below are based mainly on the REACH and CLP information available at the time of the assessment by ECHA. The conclusions are preliminary suggestions from a screening-level assessment done by ECHA with the aim to propose the next steps for further work (e.g., strengthening of the hazard conclusions, clarification of the uses and/or potential for exposure). The main source of information is the registration dossiers. Relevant public assessments may also be considered. When new information (e.g., on hazards through evaluation processes, or on uses) will become available, the document may be updated, and conclusions and actions revisited.

Table 1: Conclusions and proposed actions

Subgroup name, EC/List no, substance name	Human Health Hazard	Environmental Hazard	Relevant use(s) & exposure potential	Suggested regulatory actions
231-034-6 939-180-9	**Known or potential hazard for carcinogenicity for mutagenicity for reproductive toxicity for STOT RE** for skin sensitisation For all	**Known or potential hazard for PMT/vPvM** for EC 231-617-5, 285-331-1 **Inconclusive hazard for PBT/PMT** for EC/List 231-034-6, 257-765-0, 939-180-9, 939-338-7, 953-703-8, 200-878-7, 278-047-3, 620-285-0, 208-892-5 214-009-4, 260-568-2, 257-765-0	Industrial and professional use in adhesives and sealants, coatings and paints, thinners, paint removers, textile dyes, and impregnating products and leather treatment products. There is potential for exposure for workers and release to environment. Also article service life (ASL) for the same uses. Release from articles cannot be excluded.	**First step:** **CCH** List 939-180-9 and 939-338-7 **Pending action** EC 231-034-6 (data generation ongoing) **Potential next steps (if hazard confirmed after data generation):** CLH Harmonised classification as Carc. cat 1 would lead to generic restriction of the substance(s) in consumer mixtures by means of restriction entry 28, and in clothing, other textiles, and footwear articles by means of the restriction entry 72 of REACH Annex XVII (this would require addition of the relevant substances to Appendix 12 by the Commission through

Subgroup name, EC/List no, substance name	Human Health Hazard	Environmental Hazard	Relevant use(s) & exposure potential	Suggested regulatory actions
231-617-5 285-331-0 953-703-8 939-338-7 205-793-9		**Known or potential hazard for aquatic toxicity** EC/List 205-793-9, 200-878-7, 231-034-6, 953-703-8, 939-180-9, 939-338-7, Inconclusive hazard for aquatic toxicity for the rest.	EC 205-793-9 industrial use in phamaceuticals, as lab chemicals and intermediate with limited potential for exposure and releases to the environment. Industrial uses in adhesives and sealants and coatings and paints, thinners, paint removers for EC/List 231-617-5, 953-703-8, formulation in leather treatment products for List 939-338-7. EC 231-617-5 industrial use also in explosives. 285-331-0 adhesion promoter, uses not specified. Potential for exposure for industrial workers.	Article 68(2)). CLH as Carc. Cat 1 will also trigger regulatory action under the Cosmetic products regulation (EC) No 1223/2009. CLH as Carc. cat 1/Muta. 2 will also require company level risk management to be in place for workers and for environment CLH as skin sensitiser would be needed for the future restriction on the use of skin sensitiser substances in textile, leather, fur and hide articles. **Potential last action:** **Restriction, OEL** For EC/List 231-034-6, 939-180-9, 231-617-5, 285-331-0, 953-703-8, 939-338-7, 205-793-9 Justification: The reported professional uses are widespread (at many sites and many users) with relatively low levels of operational controls and risk management measures but with often frequent exposures with a long duration. Restriction of professional uses is preferred over authorisation as it is considered to be more efficient and effective to introduce

Subgroup name, EC/List no, substance name	Human Health Hazard	Environmental Hazard	Relevant use(s) & exposure potential	Suggested regulatory actions
200-878-7 278-047-3 620-285-0 208-892-5 214-009-4 260-568-2 257-765-0			Limited exposure and release due to intermediate registrations and substances being either not registered or having no active registrations.	controls at the level of placing on the market rather than at the level of uses. Potential exposure from articles needs further investigation, restriction for use in articles to be considered together with the restriction of professional uses. Industrial uses to be considered as part of the restriction. For the industrial uses consider also OEL (under REACH or OSH).

3 Justification for the (no) need for regulatory risk management action at EU level (if hazards confirmed)

Suggested regulatory risk management action for all substances if carcinogenicity, mutagenicity, reproductive toxicity and/or STOT RE hazards are confirmed.

Based on ECHA's assessment of hazard information currently available in the registration dossiers and considerations of structural similarity and presence of common functional moiety all substances in the group have (potentially) the human health hazards for mutagenicity, carcinogenicity, reproductive toxicity, STOT RE and skin sensitisation. Based on the information on uses and work practices there is a concern for exposure of professional and industrial workers, for some substances also of consumers via articles. Due to chemical similarities and similar use patterns there is potential for substitution among (most of) the members of the group.

Aziridine (EC 205-793-9) has a known hazard for mutagenicity and carcinogenicity with CLH as Muta. 1B and Carc. 1B. Furthermore, 2-methylaziridine (EC 200-878-7) has a CLH for Carc. 1B while EC 257-765-0 has a CLH as Muta. 2. The known carcinogenicity and mutagenicity hazards of Aziridine are preliminary **extrapolated to all other group members** based on the common structural feature (the aziridine moiety) present in all and available positive data. IARC monograph (Some Aziridines, N-, S- and O-Mustards and Selenium, 1975[7]) presented a mode of action (MoA) for alkylating agents such as aziridines via a cytotoxic effect on dividing cells damaging organs which have a high rate of cell turnover. The assumption is that aziridine cytotoxicity is associated to "*inactivation of the DNA template by the formation of single strand breaks and inter strand crosslinks, in the case of bifunctional alkylating agents, which results in an inhibition of DNA synthesis*." This effect is extrapolated to all the other substances in the group, currently without a CLH for carcinogenicity/mutagenicity. Mutagenicity hazard is also identified by Muta. 2 self-classifications for EC/List 231-617-5, 231-034-6, 939-180-9, 939-338-7, 953-703-8 and 285-331-0. The self-classifications are (mostly) based on effects observed in *in vitro* and *in vivo* mutagenicity studies (except EC 939-338-7 for which the self-classification is solely based on structural similarity with analogue EC 257-765-0). EC 231-034-6 has also applied a self-classification as Carc. 2 using a read-across approach from its hydrolysis product 4,4'-methylenedianiline (MDA; EC 202-974-4) and Aziridine, however both of the source substances have CLH as Carc. 1B.

The hazards will be (further) clarified via compliance checks (CCHs) proposed for List 939-180-9 and 939-338-7 representing structurally larger and most substituted aziridine substances in the group. The two CCHs are proposed to clarify the mutagenicity hazard, and consequently the assumed wider genotoxic carcinogenicity hazard in the group preliminary extrapolated across the group based on the common structural feature (the aziridine moiety). For EC 231-034-6 an in vivo mutagenicity study has been requested in an earlier CCH (data

[7] IARC Publications Website - Some Aziridines, N-, S- and O-Mustards and Selenium

generation still ongoing). For EC 231-034-6 its hazard concerns arise also from its hydrolysis product 4,4'-methylenedianiline (MDA; EC 202-974-4[8]; hydrolysis half-life at pH 4 0.55 h, at pH 7 5.5 h and at pH 9 42.26 h) which has a CLH as Carc. 1B, Muta. 2, STOT SE 1, STOT RE 2, Skin Sens. 1 and Aquatic Chronic 2.

Based on currently available information, there is also a potential hazard for STOT RE for all substances in the group. EC 231-034-6 is self-classified as STOT RE 1 and List 939-180-9 as STOT RE 2. Although the STOT RE self-classifications indicate different target organs for the two substances (spleen, thymus and bone marrow for one, and kidney for the other), the mode of action described in the IARC monograph for aziridine moiety (please see above) can be assumed to lead to various qualities of target organ toxicity. Therefore, a STOT RE hazard (for one or the other target organ) is preliminary extrapolated to all substances in the group. The CCH proposed for EC 939-338-7 will further clarify this hazard for the group.

Furthermore, the substances in the group have a potential hazard for reproductive toxicity. The IARC monograph stated that aziridine "*teratogenic effects depend largely on the stage of foetal development and the extent to which the compound or its active metabolites pass the placental barrier*." For Aziridine (EC 205-793-9) and EC 231-034-6 there are non-guideline developmental toxicity and OECD TG 422 screening studies available that report increased post-implantation loss, malformations and pup mortality suggesting reproductive hazard that may warrant CLH as Repr. 1B. On this basis there is also a potential reproductive toxicity hazard which is (preliminarily) extrapolated to the group members with limited information. There are currently no CLH or self-classifications by registrants for reproductive toxicity and the CCHs proposed for List 939-180-9 and 939-338-7 will further clarify the reproductive toxicity hazard in the group.

Lastly, regarding human health related hazards, there is a potential hazard for skin sensitisation for all substances in the group. EC 257-765-0 has a CLH as Skin Sens. 1, whereas EC/List 939-338-7, 231-034-6, 285-331-0, 953-703-8 are self-classified as Skin Sens. 1 or 1B and List 939-180-9 as Skin Sens. 1A. The hazard for skin sensitisation is extrapolated to all other substances based on the common mode of action.

The first step of the regulatory risk management action proposed, should the human health hazard(s) exist, is to confirm via harmonised classification (CLH) the potential mutagenic and carcinogenic, reproductive toxicity and STOT RE properties, for all of the substances without CLH for those endpoints. For mutagenicity and carcinogenicity the hazards are already better characterised due to the existing CLH on Aziridine and Methylaziridine, the known presumed common mode-of-action described in the IARC monograph and the mutagenicity self-classifications applied in majority of the dossiers. For reproductive toxicity and STOT RE the information on hazard is more limited and the CCHs flagged will provide further proof of the hazard potential.

When preparing the proposals, it may be considered what would be the best way to develop them, for instance whether to make a proposal for the group of substances, to submit them individually or jointly.

In addition, CLH for skin sensitisation should at the same time be considered for EC 231-034-6 and List 939-180-9 with uses in textiles. While alternatively these substances may be restricted through amendment of entry 72 to REACH (please

[8] EC 202-974-4, an SVHC substance being non-threshold genotoxic carcinogen belongs to the Methylenedianilines group.

see below), for skin sensitisers used in textiles, leather, fur and hide articles, there is also an ongoing restriction proposal from FR/SE. Under the current proposal for that restriction, harmonised classification would be needed for the restriction to apply.

If the CLH process confirms the substances as being Carc. 1B, Muta. 2, Repr.1B and/or as STOT RE then the CLH: i) will require company level risk management measures (RMM) for workers to be in place; ii) is needed or highly recommended in support of further regulatory processes under REACH; and iii) would lead to generic restriction of the substance(s) in consumer mixtures by means of restriction entry 28 (if Carc. 1B confirmed for all like assumed), and potentially 29, 30 (depending on the classification categories for mutagenicity and reproductive toxicity).

CLH is also a prerequisite to restrict the presence of CMRs cat. 1 in clothing, other textiles, and footwear articles, by means of the restriction entry 72 of REACH Annex XVII (this would require addition of the relevant substances to Appendix 12 by the Commission through Article 68(2)). This is relevant for EC 231-034-6 with reported professional uses and article service life as textile dyes and impregnation products in articles in consumer use. EC 231-034-6 and List 939-180-9 also have reported article service life as leather treatment products, for EC 231-034-6 also professional use, which may fall into this category.

CLH will also support regulatory action under other legislations. For instance, in this specific case

- harmonised classification as CMR cat. 1 will trigger regulatory action under the Cosmetic products regulation (EC) No 1223/2009, since CMR cat. 1 are restricted by this regulation unless specifically derogated. EC 200-878-7, 205-793-9 and 257-765-0 have reported earlier actions under the Cosmetics regulation however no such uses are reported in the REACH registration dossiers.

The substances have uses by professionals and industrial workers where there is potential for exposure. Same uses and work practices such as roller application, brushing and spraying, are reported for both professional and industrial uses making it clear that while there is concern for exposure of workers there is also a concern for substitution. Consequently there is a need to propose further regulatory risk management measures for the substances with professional as well as those with industrial uses.

Restriction of professional uses not already covered by the restriction entry 72 (please refer to text above) is therefore proposed for the two substances with professional uses EC/List 231-034-6 and 939-180-9.

The reported professional uses, described above, are expected to be widespread (at many sites and by many users). Professional use is often widespread with relatively low levels of operational controls and risk management measures but with often frequent exposures with a long duration. In addition, professional users may be self-employed and therefore not covered by occupational safety and health (OSH) legislation. Consumers may be co-exposed to the substances used by professionals as in for example coatings and paints, thinners, paint removes, leather treatment products.

Therefore, a **restriction of the substances as such or in mixtures (concentration limit in mixtures) used by professionals** is suggested after CLH.

Restriction of professional uses is preferred over authorisation as it is considered to be more efficient and effective to introduce controls at the level of placing on the market rather than at the level of uses.

In addition, the use of the most harmful substances by professional workers has been recognised as an area of concern under the European Commission's Chemicals Strategy for Sustainability**Error! Bookmark not defined.** which aims to extend to professional users under REACH the level of protection granted to consumers.

When further investigating the uses under the restriction proposed above it is suggested to consider also the need for restriction on industrial uses. This would cover substances EC/List 231-617-5, 953-703-8, 939-338-7 as well as EC 285-331-0 and Aziridine (EC 205-793-5). For EC 285-331-0 further clarification of its uses is required as only limited information is given in its registration dossier.

The setting up of an **EU-wide exposure limit for industrial workers** which can be implemented either by setting a binding occupation exposure limit (OEL) under the Chemical Agents Directive (Directive 98/24/EC) or by including it in the restriction under REACH should also be considered.

For aziridine (EC 205-793-9) and 2-methylaziridine (EC 200-878-7) national exposure limit values are already available in several Member States[9] and outside Europe. Due to the common hazard and use profiles these may be extended to other substances in the group that potentially have a concern for exposure of industrial workers (EC/List 231-034-6, 939-180-9, 231-617-5, 953-703-8, 939-338-7). Setting **an EU OEL under the OSH legislation** mainly addresses exposure via inhalation which for the substances in this group is possible via spray application of coatings and paints, polishes and as leather surface treatment. The advantage of an OEL is that it also covers the manufacture of the substances, the waste stage, intermediate uses as well as spray/dust generated at the workplace, which cannot (or only partly) be addressed by a restriction.

Furthermore, uses in paints or coatings, leather treatment products can also lead to dermal exposure. Thus, adding a skin notation to the OEL may be considered. As a result of the proposed CLH (Carc. 1B) it is expected that exposure via the dermal route will be reduced by measures under the OSH legislation. The substances do also have potential/known skin sensitisation hazard.

Alternatively**, a restriction can** also **define** reference exposure values to be used by registrants and downstream users for performing chemical safety assessments.

Regarding environmental hazards, based on the currently available information EC 231-617-5 and 285-331-1 have a potential hazard for PMT/vPvM. These substances are potentially persistent or very persistent (P/vP) as they are not readily biodegradable (*i.e.,* 17.9% degradation in OECD 301B study and 8.41% -13.72% in OECD 301F study, respectively) and potentially mobile (M) or very mobile (vM) as in absence of log Koc values the low Log Pow/Kow have been used as surrogate to indicate M/vM concern (EC 231-617-5 Log Pow 1.74 and EC 285-331-0 Log Kow values ranging between 0.4 and 3). Both substances are registered at Annex VII only and clarification of the PMT/vPvM hazard is not possible under dossier evaluation. Based on the use information available in the registration dossier both substances have a few industrial uses with limited potential for environmental

[9] For Aziridine in Belgium, Denmark, Finland, Hungary, Ireland, Latvia, Poland, Romania, Spain and the Netherlands, for 2-methylaziridine in the same countries apart from Latvia and in addition in France.

exposure. Clarifying the PMT/vPvM hazard appears hence not a priority however if the registration status and/or exposure potential changes for data generation (either via CCH or SEV) and potentially follow up actions will be re-considered when the assessment will be revisited.

Based on the currently available information majority of the substances also have a potential/known concern for aquatic toxicity. Two substances (EC 205-793-9 and 200-878-7) have CLH as Aquatic chronic 2, while many others are self-classified for aquatic toxicity (List 953-703-8 Aquatic Chronic 1, EC 231-034-6 as Aquatic Acute and Chronic 1, List 939-180-9 as Aquatic Chronic 2 and List 939-338-7 as Aquatic Chronic 3). The hydrolysis product of EC 231-034-6 has a CLH as Aquatic chronic 2, however this classification is not applied in the dossier of EC 231-034-6. While the CCHs proposed for List 939-180-9 and 939-338-7 may also further clarify the aquatic toxicity hazard in the group, the existing CLH/self-classification already requires company level risk management measures (RMM) for environment to be in place. Therefore, it is proposed that there is currently no need for EU-wide regulatory risk management. The substances for which there are currently no CLH/self-classification for aquatic toxicity are either not registered or have uses for which there is limited potential for environmental exposure, no action is therefore proposed on those for this aspect. Nevertheless, the need for CLH for aquatic toxicity may be considered alongside the CLH proposed for HH hazards to ensure consistent obligations across all actors.

There is an **inconclusive hazard** for all group members for ED HH/ENV as the information available on the substance(s) is insufficient to get a holistic view. The compliance checks proposed for List 939-180-9 and 939-338-7 may also further clarify the ED hazard in the group.

Apart from the two substances identified above as having a potential/known hazard for PMT/vPvM, and EC 205-739-9 that is readily biodegradable and therefore not PMT/vPvM, the other substances in the group have inconclusive hazards for PBT/vPvB and/or PMT/vPvM. The substances List 939-338-7, 939-180-9 and 953-703-8 with screen level information on degradation are considered as not readily biodegradable (potentially P/vP) based on the provided OECD 301 studies (% degradation values less than 60/70%). For many substances it is not possible to reliably assess whether they screen as P/vP, B/vB and/or M/vM since only QSAR adaptations have been submitted for degradation, Log Kow and/or Log Koc for example for EC 231-034-6 and EC 257-765-0. However, based on low data density, in particular for Log Kow and/or Log Koc and due to the insufficient structural similarity, no extrapolation is possible. The hydrolysis product of EC 231-034-6, 4,4'-methylenedianiline (i.e. EC 202-974-4 as explained above under HH assessment) is potentially persistent due to slow degradation rate in soil (11.6% after 56 days). However, available data indicates that it has low bioaccumulation and mobility potential in the environment, and therefore there is no need to act on this.

The inconclusive hazard for PBT/PMT of List 939-180-9 and 939-338-7 may be clarified in the CCHs proposed. If following data generation PBT/PMT hazards are identified the CLH proposed should also cover the PBT/PMT hazards. If PBT is confirmed there is a need to limit releases to the environment and therefore to further consider restricting also industrial uses in case releases to the environment are expected. For PMT, for the time being no conclusions are drawn regarding possible additional EU regulatory risk management until more clarity is available on how to regulate PMT/vPvM substances.

Annex 1: Overview of classifications

Data extracted on 23 October 2023.

EC / List No	CAS number	Substance name	Harmonised classification(*)	Classification in registrations[10]
200-878-7	75-55-8	2-methylaziridine	Category: Carc. 1B Class: Carcinogenicity Statement: H350: C>=0.01% Index number: 613-033-00-6 Acute Tox. 2 Hazard Statement: H300 (Minimum classification) Acute Tox. 1 Hazard Statement: H310 Flam. Liq. 2 Hazard Statement: H225 Hazard Category: Eye Dam. 1 Hazard Statement: H318 Carc. 1B Hazard Statement: H350 Acute Tox. 2 Hazard Statement: H330 (Minimum classification) Aquatic Chronic 2 Statement: H411	Carc. 1B H350, specific concentration: >=.01 Acute Tox. 2 H300 Acute Tox. 1 H310 Aquatic Chronic 2 H411 Eye Damage 1 H318 Acute Tox. 2 H330 Flam. Liquid 2 H225
205-793-9	151-56-4	aziridine	Index number: 613-001-00-1 Acute Tox. 2 Hazard Statement: H300 Notes: D (Minimum classification) Acute Tox. 1 Hazard Statement: H310 Notes: D Hazard Category: Skin Corr. 1B Hazard Statement: H314 Notes: D Flam. Liq. 2 Hazard Statement: H225 Notes: D Muta. 1B Hazard Statement: H340 Notes: D Carc. 1B Hazard Statement: H350 Notes: D Acute Tox. 2 Hazard Statement: H330 Notes: D (Minimum classification) Aquatic Chronic 2 Statement: H411 Additional Info: D	Carc. 1B H350 Muta. 1B H340 Flam. Liquid 2 H225 Acute Tox. 2 H300 Acute Tox. 1 H310 Acute Tox. 2 H330 Skin Corr. 1B H314 Eye Damage 1 H318 Aquatic Chronic 2 H411
214-009-4	1072-52-2	2-(azidin-1-yl)ethanol	-	-
231-034-6	7417-99-4	N,N'-(methylenedi-p-phenylene)bis(aziri	-	Carc. 2 H351 Muta. 2 H341 Acute Tox. 4 H302

[10] The column gives the classifications in registrations received under REACH. Additional classifications in intermediate and in inactive registrations (if any) are annotated and displayed last. For each classification the table includes information on the hazard category, the hazard statement and any available information on specific effects (relevant for reproductive toxicity), specific concentration limits, M-Factors and affected organs. Two classifications differing in any of these aspects are considered different and are repeated in the table. The column "Classifications in registrations" is empty if there are no Registrations/C&L notifications (hazard is unknown). The value '-' is displayed on the same columns when there are (relevant) submissions but they do not contain self-classifications (substance is not hazardous).

EC/ List No	CAS number	Substance name	Harmonised classification(*)	Classification in registrations[10]
		dine-1-carboxamide)		Skin Sens. 1 H317 STOT Rep. Exp. 1 H372, affected organs: spleen, thymus and bone marrow
231-617-5	7652-64-4	1,1'-(1,3-phenylenedicarbonyl)bis[2-methylaziridine]	-	Muta. 2 H341 Acute Tox. 4 H302 Skin Corr. 1C H314 Eye Damage 1 H318
257-765-0	52234-82-9	2-[(3-aziridin-1-ylpropionyl)methyl]-2-ethylpropane-1,3-diyl bis(aziridine-1-propionate)	Index number: 613-316-00-4 Hazard Category: Eye Dam. 1 Hazard Statement: H318 Muta. 2 Hazard Statement: H341 Skin Sens. 1 Statement: H317	Eye Damage 1 H318 Acute Tox. 2 H330 Flam. Liquid 3 H226 Skin Sens. 1 H317 Muta. 2 H341
260-568-2	57116-45-7	pentaerythritol tris(3-aziridin-1-ylpropionate)	-	-
278-047-3	74993-03-6	γ-methylaziridine-1-propylamine	-	Flam. Liquid 3 H226 Acute Tox. 4 H302
285-331-0	85068-72-0	N-methyl-P,P-bis(2-methylaziridin-1-yl)phosphinamide	-	Muta. 2 H341 Acute Tox. 3 H301 Acute Tox. 3 H311 Acute Tox. 1 H330 Skin Sens. 1 H317 STOT Single Exp. 3 H335, affected organs: Respiratory tract
620-285-0	902146-43-4	(2S)-2-Benzyl-N,N-dimethylaziridine-1-sulfonamide	-	-
939-180-9	-	Reaction mass of 2,2-bis({[3-(2-methylaziridin-1-yl)propanoyl]oxy}methyl)butyl 3-(2-methylaziridin-1-yl)propanoate and 2,2-bis({[3-(2-methylaziridin-1-yl)propanoyl]oxy}methyl)butyl 3-[2,2-bis({[3-(2-methylaziridin-1-yl)propanoyl]oxy}methyl)butoxy]propanoate	-	Muta. 2 H341 Acute Tox. 4 H302 Eye Damage 1 H318 Skin Sens. 1A H317 STOT Rep. Exp. 2 H373, affected organs: kidneys Aquatic Chronic 2 H411
939-338-7	-	Reaction products of imine and acrylate	-	Muta. 2 H341 Eye Damage 1 H318 Skin Sens. 1B H317 Aquatic Chronic 3 H412

Annex 2: Overview of uses based on information available in registration dossiers

Data extracted on 23 October 2023.

Table: Overview of main uses

EC number	200-878-7	205-793-9	231-034-6	231-617-5	257-765-0	278-047-3	285-331-0	620-285-0	939-180-9	939-338-7	953-703-8
REACH Annex	<VII	Annex X	Annex VIII	Annex VII	Annex VII	<VII	Annex VII	<VII	Annex IX	Annex IX	Annex VII
PC 20: Products such as ph-regulators, flocculants, precipitants, neutralisation agents			F, I, **P**						F	F	
PC 11: Explosives				I							
PC 29: Pharmaceuticals		I									
PC 32: Polymer preparations and compounds			F, I, **P**						F, I	F	
PC 1: Adhesives, sealants			F, I, **P**, **A**	I	F				F, I, **P**		F, I
PC 9a: Coatings and paints, thinners, paint removes			F, I, **P**, **A**	I	F				F, I, **P**, **A**		F, I
PC 18: Ink and toners			F						**A**		
PC 34: Textile dyes, and impregnating products			F, I, **P**, **A**								
PC 23: Leather treatment products			F, I, **P**, **A**						F, I, **A**	F	

EC number	200-878-7	205-793-9	231-034-6	231-617-5	257-765-0	278-047-3	285-331-0	620-285-0	939-180-9	939-338-7	953-703-8
PC 21: Laboratory chemicals		I									
PC 19: Intermediate	I	I				I		I	I		

F: formulation, I: industrial use, P: professional use, C: consumer use, A: article service life; P, C and A are highlighted in red to indicate widespread use with potential for exposure/release

Annex 3: Overview of completed or ongoing regulatory risk management activities

Data extracted on 13 November 2023.

EC/List No	RMOA, ARN	Authorisation		Restriction *	CLH	Actions not under REACH/ CLP
		Candidate list	Annex XIV	Annex XVII	Annex VI (CLP)	
200-878-7					YES	Cosmetics, OEL
205-793-9					YES	Cosmetics, OEL, food contact material
208-892-5				YES		PIC
257-765-0					YES	Cosmetics

*Some of the broad restriction entries in the Annex XVII of REACH are not represented in the overview, e.g. when the scope of the restriction is defined by its classification or the substance identification is broad (e.g. entries 3, 28-30, 40 and 75).

There are no relevant completed or ongoing regulatory risk management activities for the other substances.