Assessment of regulatory needs

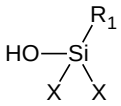
Authority: European Chemicals Agency (ECHA)

Group Name: Alkylsilanols, their salts and esters / trialkylsilanes

General structure:

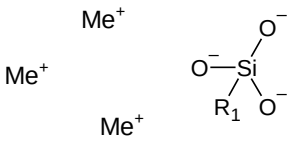
- Alkyl silanols (A) and alkali metal triolates (B)

(A)



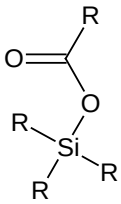
R_1 = alkyl
X = OH or R_1 (alkyl)

(B)



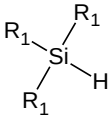
$Me^+ = Na^+$ or K^+
R_1 = alkyl

- Silyl esters of carboxylic acids



R = alkyl or another group

- Trialkylsilanes

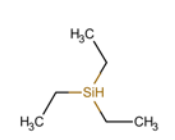
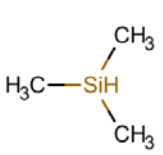
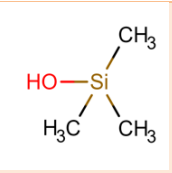
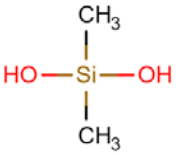
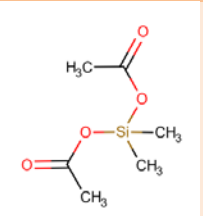
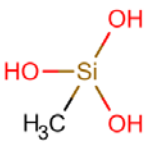
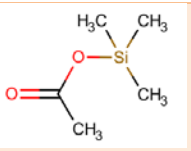


R_1 = alkyl

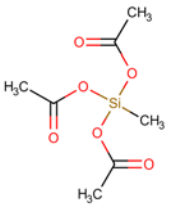
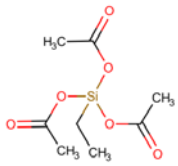
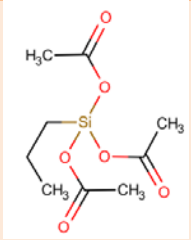
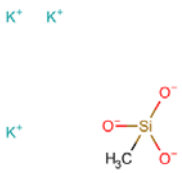
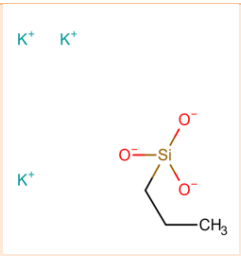
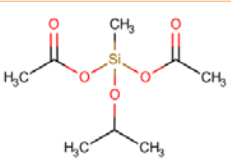
Revision history

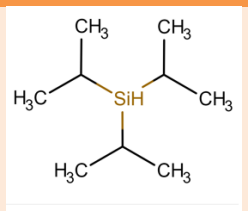
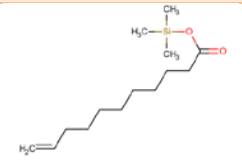
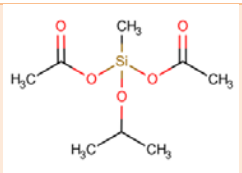
Version	*Date*	
1.0	10 January 2024	

Substances within this group:

EC/List number	CAS number	Substance name	Chemical structures	Registration type (full, OSII or TII, NONS), highest tonnage band among all the registrations (t/y) [1]
210-535-3	617-86-7	Triethylsilane		Full, 10-100
213-603-0	993-07-7	Trimethylsilane		Full, 1-10
213-914-1	1066-40-6	Hydroxytrimethylsilane		Full, 10-100
213-915-7	1066-42-8	Dimethylsilanediol		C&L notification
218-562-2	2182-66-3	Diacetoxydimethylsilane		C&L notification
219-489-9	2445-53-6	Methylsilanetriol		Not registered
220-404-2	2754-27-0	Acetoxytrimethylsilane		OSII or TII

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

EC/List number	CAS number	Substance name	Chemical structures	Registration type (full, OSII or TII, NONS), highest tonnage band among all the registrations (t/y) [1]
224-221-9	4253-34-3	Methylsilanetriyl triacetate		Full, 100-1000
240-648-3	16589-43-8	Sodium methylsilanetriolate		C&L notification
241-677-4	17689-77-9	Triacetoxyethylsilane		Full, >1000
241-816-9	17865-07-5	Propyltriacetoxysilane		Full, 100-1000
250-807-9	31795-24-1	Potassium methylsilanetriolate		Full, >1000
299-135-8	93857-00-2	Tripotassium propylsilanetriolate		Full, 10-100
442-070-9*	329039-38-5	Silanediol, 1-methyl-1-(1-methylethoxy)-, 1,1-diacetate		Full, ≥ 10

EC / List number	CAS number	Substance name	Chemical structures	Registration type (full, OSII or TII, NONS), highest tonnage band among all the registrations (t/y) [1]
464-880-1	6485-79-6	Silane, tris(1-methylethyl)-		NONS
607-358-2	24338-09-8	10-Undecenoic acid, trimethylsilyl ester		OSII or TII
638-997-5*	329039-38-5	SILANDIOL, METHYL(1-METHYLETHOXY)-,DIACETATE		C&L notification
Not (publicly) available	-	Trimethylsilyl alkynoate	Not (publicly) available	OSII or TII

This table contains also group members that are only notified under the CLP Regulation. However, the list is not necessarily exhaustive. Should further regulatory risk management action on one or more substances in the group be considered, ECHA may make an additional search for related C&L notified substances to be included in the group and develop an assessment of regulatory needs for them.

(*) When a dossier is submitted without EC number, REACH-IT automatically assigns a List number to the dossier. Sometimes, due to IT technical limitations, duplicate List numbers are created. In this Group the following are considered duplicate entries: EC 442-070-9 and List 638-997-5. In general, EC numbers take precedence over List numbers.

Contents

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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.

[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).

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.

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

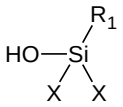
1 Overview of the group

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 structurally similar substances based on the presence of the moieties shown in the figures below.

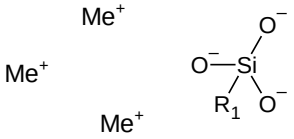
- Alkyl silanols (A) and alkali metal triolates (B)

(A)



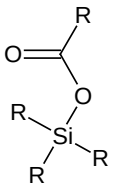
R_1 = alkyl
X = OH or R_1 (alkyl)

(B)



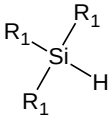
$Me^+ = Na^+$ or K^+
R_1 = alkyl

- Silyl esters of carboxylic acids



R = alkyl or another group

- Trialkylsilanes



R_1 = alkyl

The group includes 18 substances of which 9 are fully registered, based on the following types of structures: alkyl silanols and alkali metal triolates, silyl esters of carboxylic acids, and trialkylsilanes. Most of the substances are mono-constituent substances. A few are multi-constituent/UVCB substances. The alkyl groups include mainly 1-3 carbons and are mostly methyl groups. The alkyl silanols include 1-3 hydroxy groups and 1-3 alkyl groups. The silyl esters of carboxylic acids include mono-, di- and triesters, and are e.g. acetic acid esters.

Based on information reported in the REACH registration dossiers, a few substances in the group are used in applications such as adhesives, sealants, coatings and paints, thinners, paint removers, fillers, putties, plasters, modelling clay as precursors, cross-linking agents, surface modifier, etc. In these applications, uses by professional workers and consumers are reported for some group members and, therefore, these uses can be considered widespread with a potential for exposure and releases. Other less common applications reported for some substances in the group include uses by professional workers and consumers in non-metal surface treatment products, textile dyes, washing and cleaning products, water treatment chemicals, cosmetics and personal care products and extraction agents. Although these uses are less frequently reported, they can be considered widespread with a potential for exposure and releases.

Many substances in the group are also used as intermediates or as laboratory chemicals, mostly in industrial setting and sometimes in professional setting for the

laboratory chemicals. In these cases, the potential for exposure and releases is considered much lower.

The substances of this group react upon use and are therefore unlikely to end-up in articles. However, it is possible that their reaction products end-up in articles. Article service life is reported for uses in adhesives, sealants, coatings and paints, thinners, paint removers, fillers, putties, plasters, modelling clay, inks and toners and polymer preparations and compounds.

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.

Subgroup name, EC no, substance name	Human Health Hazard	Environmental Hazard	Relevant use(s) & exposure potential	Suggested regulatory actions
210-535-3 **213-603-0** **213-914-1** **213-915-7 (C&L notification)** **218-562-2 (C&L notification)** **219-489-9 (not registered)** **220-404-2** **224-221-9** **240-648-3 (C&L notification)** **241-677-4** **241-816-9** **250-807-9** **299-135-8** **442-070-9** **638-997-5** **464-880-1** **607-358-2** **Trimethylsilyl alkynoate**	Known or potential hazard for reproductive toxicity and ED for all substances Known or potential hazard For STOT RE for EC/List 213-603-0; 220-404-2; 607-358-2	Known or potential hazard for ED all substances based on HH only Known or potential hazard for PBT/vPvB for EC 213-914-1 only Known or potential hazard for aquatic toxicity for EC 213-914-1; 250-807-9; 210-535-3; 224-221-9; 241-677-4;	For EC/List 213-914-1, 250-807-9, 299-135-8, 213-603-0, 224-221-9, 241-677-4, 241-816-9, 442-070-9 IND and PROF and/or CONS uses where potential for exposure is likely (i.a. adhesive, sealants, coatings and paints, fillers and putties, non-metal surface treatment products).	**First step:** CCH for EC 213-914-1 (targeted to ENV), 241-677-4, 241-816-9 and 299-135-8 **Potential next steps (if hazard confirmed):** CLH for all substances as Repr. 1B SVHC identification for ED HH/ENV (and for EC 213-914-1 as PBT/vPvB) **Potential last action:** Restriction Justification: Releases to the environment from consumer and widespread professional uses cannot be avoided. Widespread professional uses are typically non-

Subgroup name, EC no, substance name	Human Health Hazard	Environmental Hazard	Relevant use(s) & exposure potential	Suggested regulatory actions
		241-816-9; 299-135-8; Known or potential hazard for PMT/vPvM all substances		contained and non-automated leading to releases to the environment. 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. 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

3 Justification for the need for regulatory risk management action at EU level (if hazard confirmed)

ECHA is currently working on the assessment of regulatory needs for various groups of silanes. The silanes have been split in several groups to facilitate the assessment of this large group of substances. Therefore, it was not possible to assess the potential interchangeability of the substances for some of their uses between groups. ECHA may need in the future to revisit the assessment considering all groups of silanes in order to account for the potential for substitution as this can impact the regulatory actions proposed.

It should be noted that based primarly on experimental hydrolysis studies, the alkyl silanols and alkali metal triolates and silyl esters of carboxylic acids substances hydrolyse rapidly whilst the trialkylsilane substances hydrolyse more slowly, under neutral conditions, but all ultimately release silanol-containing hydrolysis products, which are not readily biodegradable. For this group, the alkylsilanol hydrolysis products include EC 209-903-6, CAS 5651-16-1 and CAS 5651-30-9, as well as EC 213-914-1, EC 213-915-7 and EC 219-489-9 (the last three substances are also members of the group). The alkylsilanol hydrolysis products, EC 213-914-1, EC 213-915-7 and EC 219-489-9 are also common to other silanes/siloxanes groups.

For the environment, due to the rapid rate of hydrolysis of both for alkyl silanols and alkali metal triolates and silyl esters of carboxylic acids substances, the potential hazards identified can be generally associated with the alkylsilanol hydrolysis products. For the trialkylsilane substances, which hydrolyse much more slowly, the potential hazards identified can be generally associated with either the parent and/or the alkylsilanol hydrolysis products.

Extensive read-across within and between silane groups have been used by the registrants, which raises some level of uncertainty concerning the observed hazards since read-across validity has not been assessed. Whilst data generation is proposed for this group, the final proposed selection of substances for which to conduct a CCH will consider commonalities to other silane groups, and the intrinsic properties of the substances (e.g. corrosivity), tonnages and uses.

Based on currently available information, suggested regulatory risk management action – restriction if the following hazards are confirmed: reproductive toxicity and/or ED HH/ENV (for all sustbance in the group), and STOT RE (for ECs 213-603-0, 220-404-2, 607-358-2) due to the potential for release/exposure of **all** substances in the group, and/or PBT/vPvB hazards for EC 213-914-1.

Based on ECHA's assessment of currently available hazard information, **potential** hazards were identified for the following human health hazards:

Potential reproductive (fertility and development) and ED toxicity are identified for all substances in the group based on observed effects (including fetal variation and malformations, delayed ossification, changes in reproductive organs, and thyroid effects), from two OECD 422 and two OECD 414 studies, available for three of the substances. None of the group members have a harmonised or self-classification for reproductive toxicity, with the exception of trimethylsilyl alkynoate which is self-classified as Repr. 2.

The conclusions on the potential reproductive toxicity and ED hazards are also based on the conclusions of other silane groups of substances sharing the same hydrolysis products (i.e. EC 213-915-7, 213-914-1, 219-489-9). From this it is assumed that similar toxicity can be driven by the potential toxic effects of the hydrolysis products.

Reproductive and ED toxicity are preliminary extrapolated, to other group members based on common structural features and the formation of common hydrolysis products. However, within the group, there is a **high degree of uncertainty** due to the limited amount of hazard information available. Therefore, there is currently not sufficient data to propose a group CLH for reproductive toxicity for this group of substances. However, for one single substance (EC 213-915-7, not registered), the available information could be sufficient for Repr. 1B classification. If the data generated via the proposed compliance cheks confirm the potential reprotoxicity hazard, a group CLH could be considered.

Compliace check for HH is currently proposed for EC 241-677-4, 241-816-9 and 299-135-8 to clarify the potential reproductive and ED toxicity. The conclusion will be revisited based on reproductive toxicity and ED hazards (or lack of hazards) that will be found in this group and in related silane groups, where extrapolation will be possible, after data generation.

There is no information on the hazard(s) of the following substances due to their registration status (NONs, inactive/revokedregistration(s), not registered or intermediate): EC/List 219-489-9, 220-404-2, 240-648-3, 464-880-1, 607-358-2, trimethylsilyl alkynoate, 218-562-2. However, based on common structural features and the formation of common hydrolysis products within this group and other silane groups, it is possible to identify and assign potential hazards for reproductive and ED toxicity.

Potential target organ toxicity (liver, kidney, thyroid) is identified for the following substances EC 213-603-0, 220-404-2, 607-358-2, based on the hydrolysis product EC 213-914-1, in common with some substances in the group on hydrocarbyl siloxanes.

No hazard or unlikely hazard for mutagenicity, carcinogenicity and skin sensitisation for all group members (except EC 464-880-1 self-classified as Skin Sens. 1). The conclusions for genotoxicity and carcinogenicity are based on negative studies for 4 members of the group and two OECD 422 studies not reporting indications of neoplasia or hyperplasia. For skin sensitisation, EC 464-880-1 (intermediate) is self classified as Skin Sens. 1, but no data is available. For the rest of the group the conclusion is that skin sensitisation is unlikely based on a negative OECD 406 study and negative read-across data. This conclusion is extrapolated to the members of the group with no data available based on chemical structure similarity.

Based on ECHA's environmental hazard assessment of currently available hazard information, the following **known or potential environmental hazards** were identified: from the alkyl silanols and alkali metal triolate substances, only EC 213-914-1 has **potential PBT/vPvB hazards** based on screening information, not readily biodegradable, with some level of uncertainties as potential B is based on read-across and potential T is based on HH data (and in addition there is missing long-term aquatic toxicity).

A CCH to clarify potential PBT/vPvB properties by generating new data and assessing the existing data is proposed.

No PBT/vPvB hazards with the parent and/or with the Si-containing hydrolysis products for the rest of the group.

All the substances from the group (alkyl silanols and alkali metal triolates, silyl esters of carboxylic acids and the trialkylsilane) have **potential persistency, mobility and toxicity hazards**, since the parent and/or the Si-containing hydrolysis products are potentially P/vP and potentially mobile based on screening information (not readily biodegradable, log Koc or log Kow values of < 3, as well as potentially T from HH data (mostly with a high degree of uncertainty due to data gaps for long-term aquatic toxicity). This also includes EC 213-914-1 which based on read-across is potentially M but also based on read-across is potentially B. Due to potential PMT/vPvM properties and taking into account human health data, CCH is proposed to clarify P/vP, mobility and T for the following substances registered above 100 tonnes per year: EC 241-677-4, 241-816-9, 299-135-8 and 213-914-1. For the substances for which no data generation is possible, the conclusion will be revisited based on persistency, mobility and toxicity hazards (or lack of hazards) that will be found for similar substances in this group (and in related silane groups) after data generation.

All the substances from the group have **potential ENV ED hazard** (with uncertainty) based on indications of ED properties from the available Human Health (HH) data only, within the group and/or from other silane group(s). Data generation is proposed for substances EC 241-677-4, 241-816-9 and 299-135-8.

Substances are used by professional workers and consumers in applications such as adhesives and sealants, coatings and paints, fillers and putties etc., where there is a potential for exposure and releases to the environment, except for EC/List: 213-914-1, 213-603-0, 464-880-1, 220-404-2, 607-358-2 and Trimethylsilyl alkynoate. These reported uses also occur in industrial settings under conditions where there is a potential for exposure to workers and releases to the environment (such as industrial spraying, dipping & pouring, roller application and brushing).

Group members EC: 213-914-1, 213-603-0, 464-880-1, 220-404-2, 607-358-2 and Trimethylsilyl alkynoate are reported to be used in industrial applications where the potential for exposure and releases in the environment can generally be considered of low concern (laboratory chemicals or intermediates, polymer preparations, semiconductors). However, due to structural similarity, potential for substitution with other substances of the group can be assumed and therefore risk management measures are proposed for all group members.

The first step of the regulatory risk management should the hazard exist, is the confirmation of hazard via **harmonised classification (CLH)** as Repr. 1B hazard for all substances in the group. 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.

CLH i) will require company level risk management measures (RMM) under the occupational safety and health (OSH) legislation for workers to be in place, ii) is needed or highly recommended for further regulatory processes under REACH and iii) is a prerequisite to restrict the presence of the substances in consumer mixtures, by means of restriction entry 30.

Furthermore, CLH is also a prerequisite to restrict the presence of the substances in clothing and other textiles, and footwear articles, by means of 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)); EC 250-807-9 is reported to be used in textile dyes, and impregnating products.

For all the substances with potential ED properties and for the substance with potential PBT/vPvB properties (EC 213-914-1) the first step of the regulatory risk management action proposed, should the hazards exist, is the confirmation of hazard via **SVHC identification** as PBT/vPvB and ED HH/ENV.

SVHC identification and CLH are highly recommended as a step prior to restriction. In addition, SVHC identification brings immediate obligations for suppliers of the substances such as (i) supplying a safety data sheet and communicating on the safe use of the substances, (ii) responding to consumer requests within 45 days and (iii) notifying ECHA if the article they produce contains the substance above regulatory threshold.

Confirmation of the hazard properties via SVHC identification is not considered sufficient to minimise potential releases of the substances to the environment. Potential for release and exposure is expected in particular from consumer uses (e.g. adhesives, sealants, fillers, putties, plasters and coatings) where releases to the environment cannot be avoided.

The following professional uses as adhesives, sealants, coatings and paints, fillers and putties, ink and toners as well as in non-metal surface treatment products, textile dyes and impregnating products, water treatment products, cosmetics and personal care products are expected to be widespread (at many sites and by many users).

Widespread professional uses are typically non-contained and non-automated leading to releases to the environment. In addition, the listed widespread professional uses are expected to be with relatively low levels of operational controls and risk management measures but with often frequent exposures with a long duration. Moreover, some professional users may be self-employed and therefore not covered by occupational safetly and health (OSH) legislation.

Consumers may be co-exposed to the substances used by professionals (adhesives, sealants, coatings and paints, fillers and putties, ink and toners as well as in non-metal surface treatment products, textile dyes and impregnating products, water treatment products, cosmetics and personal care products).

Therefore, a **restriction of the substances as such or in mixtures (concentration limit in mixtures) used by professionals** is suggested after SVHC identification and CLH, with the aim to minimise exposures and emissions to humans and the environment.

Furthermore, emissions to the environment and exposure towards workers cannot be excluded also for the abovementioned industrial uses as laboratory chemicals or intermediates, polymer preparations, semiconductors. It is therefore suggested to cover possibly also industrial uses as part of the restriction, also in light to the fact that authorisation might not be applicable in most of the cases (use as intermediate or as monomer in polymer production).

The use of PBT/vPvB and ED substances by consumers and professional workers has been recognised as an area of concern under the European Commission's Chemicals Strategy for Sustainability[5].

Moreover, potential exposure from articles needs further investigation. The need for restricting substances in articles used by professionals or consumers (reported

[5] European Commission, *Chemical Strategy for Sustainability Towards a Toxic-Free Environment*, available at https://ec.europa.eu/environment/pdf/chemicals/2020/10/Strategy.pdf

for EC 224-221-0, 250-807-9, 241-667-4) should be considered in the context of the restriction of professional uses.

In addition, all the substances in the group have potential PMT/vPvM hazards. It is suggested to also take into consideration the potential PMT/vPvM hazards when developing the restriction proposal.

Annex 1: Overview of classifications

Data extracted on 20 August 2022

EC / List No	CAS number	Substance name	Harmonised classification	Classification in registrations[6]
210-535-3	617-86-7	Triethylsilane	-	Flam. Liquid 2 H225 Aquatic Acute 1 H400 Aquatic Chronic 1 H410
213-603-0	993-07-7	Trimethylsilane	-	Flam. Gas 1A H220 Compressed gas H280
213-914-1	1066-40-6	Hydroxytrimethylsilane	-	Flam. Liquid 2 H225 Acute Tox. 4 H332 Aquatic Chronic 3 H412
213-915-7	1066-42-8	Dimethylsilanediol	-	-
218-562-2	2182-66-3	Diacetoxydimethylsilane	-	-
220-404-2	2754-27-0	Acetoxytrimethylsilane	-	Flam. Liquid 2 H225 [intermediate (active)]
224-221-9	4253-34-3	methylsilanetriyl triacetate	-	Acute Tox. 4 H302 Skin Corr. 1C H314 Skin Corr. 1B H314 Eye Damage 1 H318
240-648-3	16589-43-8	sodium methylsilanetriolate	-	-
241-677-4	17689-77-9	Triacetoxyethylsilane	-	Acute Tox. 4 H302 Skin Corr. 1B H314 Eye Damage 1 H318
241-816-9	17865-07-5	Propyltriacetoxysilane	-	Skin Corr. 1B H314
250-807-9	31795-24-1	potassium methylsilanetriolate	-	Skin Corr. 1A H314

[6] 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 (hazard is unknown). The value '-' is displayed on the same column when there are (relevant) submissions but they do not contain self-classifications (substance is not hazardous).

299-135-8	93857-00-2	tripotassium propylsilanetriolate	-	Skin Corr. 1A H314
442-070-9 **(Duplicate 638-997-5** C&L notification has the same CLP)	-	Silanediol, 1-methyl-1-(1-methylethoxy)-, 1,1-diacetate	-	Flam. Liquid 3 H226 Eye Damage 1 H318
464-880-1	6485-79-6	Silane, tris(1-methylethyl)-	-	Skin Irrit. 2 H315 [intermediate (active)] STOT Single Exp. 3 H335, affected organs: respiratory tract [intermediate (active)] Flam. Liquid 3 H226 [intermediate (active)] Eye Irrit. 2 H319 [intermediate (active)] STOT Single Exp. 3 H335, affected organs: respiratory organs [intermediate (active)] Skin Sens. 1 H317 [intermediate (active)]
607-358-2	24338-09-8	trimethylsilyl undec-10-enoate	-	-
Not (publicly) available	Not (publicly) available	Trimethylsilyl alkynoate	-	Aquatic Chronic 3 H412 [intermediate (active)] Repr. 2 H361, specific effect:H361d: Suspected of damaging the unborn child [intermediate (active)] Skin Corr. 1B H314 [intermediate (active)] Flam. Liquid 2 H225 [intermediate (active)] Eye Damage 1 H318 [intermediate (active)]

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

Data extracted on 30 August 2022

Main types of applications structured by product or article types	EC 220-404-2	EC 224-221-9	EC 241-677-4	EC 241-816-9	*EC 442-070-9	List 607-358-2	Trimethylsilyl	EC 210-535-3	EC 213-603-0	EC 464-880-1	EC 213-914-1	EC 250-807-9	EC 299-135-8
PC 1: Adhesives, sealants		F, I, **P**, **C**, **A**	F, I, **P**, **C**, **A**	F, I, **P**, **C**	F, I, **P**, **C**						F, I	**C**	
PC 2: Adsorbents									I				
PC 8: Biocidal products (e.g. disinfectants, pest control)		F, I											
PC 9a: Coatings and paints, thinners, paint removers		F, I, **A**							I		F, I	F, I, **P**, **C**	F
PC 9b: Fillers, putties, plasters, modelling clay												F, I, **P**, **C**, **A**	F, **P**, **C**
PC 15: Non-metal-surface treatment products												F, I, **P**, **C**	I
PC 18: Ink and toners		**A**											
PC 19: Intermediate	I	F, I	F	F		I	I	I	I	I	I	I, **P**	I
PC 20: Products such as ph-regulators, flocculants, precipitants, neutralisation agents											F, I		
PC 21: Laboratory chemicals		I	I, **C**	I	I	I		F, I, **P**	I		I	I, **P**, **C**	I
PC 29: Pharmaceuticals		I						I					
PC 32: Polymer preparations and compounds		F, I, **A**							I		I		
PC 33: Semiconductors		I							I				
PC 34: Textile dyes, and impregnating products											F, I	F, I, **P**	
PC 35: Washing and cleaning		F, I, **C**							I		F, I		

products													
PC 37: Water treatment chemicals												I, **P**, **C**	
PC 39: Cosmetics, personal care products		**P**											
PC 40: Extraction agents			**C**										

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 10 August 2022

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