



Committee for Risk Assessment
RAC

Annex 2
Response to comments document (RCOM)
to the Opinion proposing harmonised classification and
labelling at Community level of
vinyl acetate

ECHA/RAC/ CLH-O-0000001742-77-01/A2

Adopted
10 June 2011

COMMENTS AND RESPONSE TO COMMENTS ON CLH: PROPOSAL AND JUSTIFICATION

[ECHA has compiled the comments received via internet that refer to several hazard classes and entered them under each of the relevant categories/headings as comprehensive as possible. Please note that some of the comments might occur under several headings when splitting the given information is not reasonable.]

Substance name: Vinyl acetate

CAS number: 108-05-4

EC number: 203-545-4

General comments

Date	Country/ Person/Organisation/ MSCA	Comment	Response	Rapporteur comments
26/08/2010	France / Elodie Pasquier / MSCA	<p>The recommendations agreed at the TC C&L regarding the classification of vinyl acetate for health effects are supported in absence of any new study since the TC C&L discussions and in agreement with the classification proposed in the CLH report.</p> <p>It is however noted that classification for some of these endpoints is not considered as a priority under CLP.</p> <p>Besides, compared to the proposal submitted at the TC C&L an additional classification for EUH19 has been introduced in the current CLH dossier for the unstabilised form of vinyl acetate and we agree that classification EUH19 is justified based on data.</p> <p>It is noted that additional guidance from the Commission on what are relevant justifications for harmonisation of classification of hand-over substances would be helpful to clarify these points.</p> <p>Finally, note D (“Certain substances which are susceptible to spontaneous polymerisation or decomposition are generally placed on the market in a stabilised form. It is in this form that they are listed in Part 3. However, such substances are sometimes placed on the market in a non-stabilised form. In this case, the supplier must state on the label the name of the substance followed by the words ‘non-stabilised’”) is included in the current harmonised classification but is not mentioned in the present classification proposal of revision. Addition of the note D should be considered in particular for the unstabilised entry.</p>	<p>Thank you for the support regarding classification proposed for the health hazards classes.</p> <p>Note D is now included in the CLH report.</p>	<p>Thank you for the support.</p> <p>Noted</p> <p>Yes, the rapporteurs agree that Note D should continue to be applied to vinyl acetate in Annex VI of the CLP Regulation.</p>

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26/08/2010	Sweden / MSCA	In absence of any new data Sweden supports the agreement, on the proposed classification and labelling for Vinyl acetate, taken by the Technical Committee on Classification and Labelling (Directive 67/548/EEC) ('TC C&L').	Thank you for the support.	Thank you for the support.
23/09/2010	UK / MSCA	We recognise that this is a 'transition' substance for which the C&L was agreed by the TC C&L. As such, the comments submitted below are observations to ease the progress of vinyl acetate through the new CLP harmonised classification and labelling system.	The statement was noted.	Noted.
30/09/2010	Ireland / Health & Safety Authority	The Irish CA is in agreement with the proposal to amend the existing Annex VI entry to include the additional classification of Carc. Cat 3; R40, Xi; R37, Xn; R20, which was previously agreed at the TC C&L in September 2007. We also agree to the proposal under CLP of Carc. 2 H351, STOT SE 3 H335 and Acute Tox. 4 H332.	Thank you for the support.	Thank you for the support.
01/10/2010	Germany / Gesine Fickel / Celanese Chemicals Europe GmbH / Company-Manufacturer	<p>p. 3 ff of the Annex VI Report:</p> <p>Stabilized vinyl acetate Industry agrees with the proposed classification for stabilized vinyl acetate</p> <ul style="list-style-type: none"> • Carc. Cat. 3 R40 Limited evidence of a carcinogenic effect • F Highly flammable R11 Highly flammable • Xn Harmful R20 Harmful by inhalation • Xi Irritant R37 Irritating to respiratory system <p>Unstabilized vinyl acetate Industry agrees with the following proposals for classification for unstabilized vinyl acetate</p> <ul style="list-style-type: none"> • Carc. Cat. 3 R40 Limited evidence of a carcinogenic effect • F Highly flammable R11 Highly flammable • Xn Harmful R20 Harmful by inhalation • Xi Irritant R37 Irritating to respiratory system <p>We disagree with the proposed inclusion of R19 / EUH019 "May form explosive peroxides" for vinyl acetate in a not-stabilized form for the following</p>	<p>Thank you for the support regarding classification proposed for the health hazards classes.</p> <p>Please see our response below.</p>	<p>Thank you for the support.</p> <p>Noted.</p> <p>Noted; the rapporteurs do not believe a sufficient case has been</p>

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		reasons: • According to experimental investigations, vinyl acetate polyperoxide is not sufficiently stable to increase to a concentration level that forms explosive peroxides. • Peroxides may act as initiator of an autopolymerisation reaction, but are consumed in this process and do not build up explosive concentration levels.		made to include R19/ EUH019, or to create a new entry in Annex VI for non-stabilised vinyl acetate (see the Opinion and Background Document for argumentation). .
01/10/2010	Denmark / Danish EPA / National Authority	Denmark agrees with the proposed classification. The proposal for the classification was submitted to the TC C&L and was agreed in September 2007. As no further data has been available for assessment of the toxicity, the Danish decision will re-main.	Thank you for the support.	Thank you for the support.

Carcinogenicity

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23/09/2010	UK / MSCA	Vinyl acetate induced a number of tumour types in two species. The evidence indicates that it should be classified for carcinogenicity. The dossier submitter has proposed a classification of Carc 2 – H351 (CLP). To understand how this decision was reached, it would be helpful to include a discussion of why Carc 2 has been proposed rather than Carc 1B. Some factors to consider are the relatively high doses at which many of the tumours were induced; and the highly irritant nature of vinyl acetate which may lower the hazard to humans compared with repeated exposures under experimental conditions in a laboratory setting. Also, as it has been postulated that the substance has a threshold effect, is anything known about the nature of the threshold that may lower the concern of the tumours' relevance to humans?	There was a detailed and extensive argumentation for classification of vinyl acetate as Carc. 2; H351 / Carc. Cat. 3; R40 presented in the CLH-report. Based on the carcinogenic potential of vinyl acetate in two animal species of both sexes and by 2 uptake routes (inhalation and oral) and the absence of reliable human	We support the response from German CA

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			data the substance might pose a cancer risk for humans. Carcinogenicity is thought to act via a secondary mechanism and the concern may only be relevant above threshold concentrations. New data explaining the nature of the threshold or reanalysing the details of the mode of action are lacking.	

Mutagenicity

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23/09/2010	UK / MSCA	Page 49. Mutagenicity. Vinyl acetate was positive in a number of in vitro tests but equivocal/questionable results were obtained from in vivo studies. Although local genotoxic effects at the site of contact are possible and may be related to the induction of carcinogenicity, this would not be likely to lead to genotoxicity in the germ cells. Under the CLP criteria, a classification as Muta Cat 1 or 2 specifically relates to the potential of a substance to induce heritable mutations in the germ cells of humans. Therefore we agree that a classification for mutagenicity should not be proposed.	Thank you for the support.	Thank you for the support.

Toxicity to reproduction

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Date	Country/ Person/Organisation/ MSCA	Comment	Response	Rapporteur comments

Respiratory sensitisation

Date	Country/ Person/Organisation/ MSCA	Comment	Response	Rapporteur comments

Other hazards and endpoints

Date	Country/ Person/Organisation/ MSCA	Comment	Response	Rapporteur comments
23/09/2010	UK / MSCA	<p>Page 18. Acute toxicity. We support the proposal to classify as Xn; R20 / Acute Tox. 4.</p> <p>Page 19. Irritation. We support the proposal to classify as Xi; R37 / STOT-SE 3.</p> <p>Page 42. Repeated dose toxicity. We agree that the data on repeated dose toxicity (inhalation) do not support classification for this end-point.</p>	Thank you for the support.	Thank you for the support.
30/09/2010	Ireland / Health & Safety Authority	The classification agreed by the TC C&L did not appear to include a proposal for R19. However, based on the justification provided in the Annex VI report, and on the basis of providing supplemental hazard information, we can agree to the addition of R19/ EUH019 for the unstabilised form.		Noted – however, please see the Opinion and Background Document for our position on this issue.
01/10/2010	Germany / Gesine Fickel / Celanese Chemicals Europe GmbH / Company-Manufacturer	<p>Details on the inclusion of R19 / EUH019 "May form explosive peroxides" for vinyl acetate in a not-stabilized form are submitted in the attached document "Response to RAC Proposal for a Revised classification of Vinyl acetate 2010-10-01.pdf"</p> <p><i>ECHA's comment: The comment below was sent as an attachment (Response to RAC Proposal for a Revised classification of Vinyl acetate 2010-10-01.pdf):</i></p>	According to the classification principles set out in Directive 67/548/EEC - Annex VI, as well as Regulation (EC) No 1272/2008, Annex	We are not entirely convinced that vinyl acetate is sufficiently "potent" at forming explosive peroxides to justify R19/EUH019. In the future MS CAs and/or

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		<p>Response to the Risk Assessment Committee (RAC)'s Proposal for a Revised Classification of Vinyl acetate</p> <p>Note on format Original text from "Annex VI Report Proposal For Harmonised Classification And Labelling, Substance Name: Vinyl acetate" is highlighted in grey.</p> <p>Stabilized vinyl acetate Industry2 agrees with the proposed classification for stabilized vinyl acetate</p> <ul style="list-style-type: none"> • Carc. Cat. 3 R40 Limited evidence of a carcinogenic effect • F Highly flammable R11 Highly flammable • Xn Harmful R20 Harmful by inhalation • Xi Irritant R37 Irritating to respiratory system <p>Unstabilized vinyl acetate Industry agrees with the following proposals for classification for unstabilized vinyl acetate</p> <ul style="list-style-type: none"> • Carc. Cat. 3 R40 Limited evidence of a carcinogenic effect • F Highly flammable R11 Highly flammable • Xn Harmful R20 Harmful by inhalation • Xi Irritant R37 Irritating to respiratory system <p>We disagree with the proposed inclusion of R19 / EUH019 "May form explosive peroxides" for vinyl acetate in a not-stabilized form for the following reasons:</p> <ul style="list-style-type: none"> • According to experimental investigations, vinyl acetate polyperoxide is not sufficiently stable to increase to a concentration level that forms explosive peroxides. • Peroxides may act as initiator of an autopolymerisation reaction, but are consumed in this process and do not build up explosive concentration levels. <p>Detailed Comments According to the classification principles outlined in Directive 67/548/EEC, Annex VI, as well as Regulation (EC) No 1272/2008, Annex II, 1.1.5, R19 / EUH019 "May form explosive peroxides" is to be applied "for substances and</p>	<p>II, 1.1.5, the statement R19 / EUH019 "May form explosive peroxides" should be applied for substances and mixtures which may form explosive peroxides during storage, such as diethyl ether, 1,4-dioxan.</p> <p>There are neither criteria nor test methods provided for this statement and no further explanatory notes in the "Manual of Decisions for implementation of the sixth and seventh amendments to Directive 67/548/EEC on Dangerous substances (Directives 79/831/EEC and 92/32/EEC) non-confidential version" for when</p>	<p>ECHA may want to reflect on the general applicability of R19/ EUH019 and consider whether additional guidance is needed for industry to apply this labelling phrase consistently.</p> <p>Please see the Opinion and Background Document for our detailed position on this issue.</p>

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		<p>mixtures which may form explosive peroxides during storage, e.g. diethyl ether, 1,4-dioxan."</p> <p>In other words, R19 / EUH019 is to be assigned for substances in which 1. in storage under normal conditions peroxides are formed and then 2. in a secondary step the concentration of these peroxides increases to a level that the peroxides themselves cause an exothermic reaction.</p> <p>Stability of Vinyl Acetate Polyperoxide</p> <p>According to experimental investigations, vinyl acetate polyperoxide is not sufficiently stable to increase to a concentration level that forms explosive peroxides:</p> <ul style="list-style-type: none"> • Levy (1992) investigated the effect of oxygen on vinyl acetate polymerisation. The vinyl acetate polyperoxide may initiate polymerisation, but will not form concentrations in which the polyperoxide itself can cause explosion. The author concludes from experimental results that vinyl acetate polyperoxide has a relatively lower stability due to the side chain group G (see formula below) being an "acetyloxy group that is attached to the polymer chain carbon through the atom's second carbon -oxygen bond. $\text{R}-(\text{C}_2\text{H}_4-\text{C}(\text{H})_2-\text{O}-\text{O})_n-\text{H}$ <p>This formally relates the site to a typically unstable gemdiol"</p> $\text{R}-(\text{C}_2\text{H}_4-\text{C}(\text{H})_2-\text{O}-\text{O}-\text{C}(=\text{O})\text{CH}_3)_n-\text{H}$ <ul style="list-style-type: none"> • Barnes et al. (1950) had concluded that vinyl acetate forms a polyperoxide when 	<p>R19/EUH019 should be assigned.</p> <p>The GHS uses the term "Hazard classification" to indicate that only the intrinsic hazardous properties of substances or mixtures are considered.</p> <p>The risk posed by a substance depends both on the intrinsic properties of the substance (hazard) and of exposure.</p> <p>The distinction between hazard and risk is a very important classification principle.</p> <p>The Industry's interpretation on labelling requirement for R19/EUH019 is a risk evaluation (according to experimental investigations),</p>	

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		<p>heated with oxygen, but this polyperoxide is significantly less stable than e.g. polyperoxides formed in styrene or methyl methacrylate. These results also indicate that vinyl acetate polyperoxide will not form concentrations in which the polyperoxide itself can cause explosion.</p> <p>Peroxides may act as initiator of an autopolymerisation reaction, but are consumed in this process and do not build up explosive concentration levels</p> <p>Industry agrees that in vinyl acetate peroxides may be formed in the presence of oxygen or air. However, in the case of unstabilized vinyl acetate, it would not be peroxides exploding, but the effect peroxides have on vinyl acetate may cause a polymerisation reaction. In unstabilized vinyl acetate, peroxides which may be formed in storage will cause the substance to polymerize as the peroxides act as initiators of a polymerisation process. Gustin (2005) states "The chain polymerization of the monomer may be initiated by radical initiators including inorganic or organic peroxides. In addition, vinyl acetate is a peroxide-forming chemical in the presence of oxygen or air, as are many vinyl derivatives.</p> <p>Therefore, vinyl acetate is a monomer which may autopolymerize as a result of peroxide formation under an oxygen-containing atmosphere." (emphasis added)</p> <p>Comments on details in Annex VI Report - PROPOSAL FOR HARMONISED CLASSIFICATION AND LABELLING; Substance Name: Vinyl acetate</p> <p>page 77/78</p> <p>6.1 Explosivity</p> <p>[...]</p> <p>Thermal stability:</p> <p>The monomer is volatile and tends to self-polymerise, and is therefore stored and handled cool and inhibited, with storage limited to below 6 months.</p> <p>Vinyl acetate is normally inhibited with hydroquinone to prevent polymerisation. A combination of too low level of inhibitor and warm, moist storage conditions may lead to spontaneous polymerisation. This process involves autoxidation of acetaldehyde (a normal impurity produced by hydrolysis of the monomer) to a peroxide which initiates exothermic polymerisation as it decomposes. <u>In bulk, this may accelerate to a dangerous extent. Other peroxides or radical sources will initiate the exothermic polymerisation.</u></p> <p>[1] P. G. Urben (Ed.): <i>Bretherick's Handbook of Reactive Chemical Hazards</i>, 7th ed., Elsevier 2007.</p> <p>Vinyl acetate, unstabilised, is proposed to classify additionally with R19/EUH019.</p>	<p>therefore they do not agree with the proposed labelling with R19 for unstabilised vinyl acetate.</p> <p>There is no dissent that vinyl acetate is a peroxide-forming chemical in the presence of oxygen or air.</p> <p>The physical-chemical properties of vinyl acetate in a stabilised form and in a non-stabilised form are different.</p> <p>Vinyl acetate monomer (VAM) is a reactive molecule. VAM reacts with air or water to produce peroxides which initiate explosively violent polymerization.</p> <p>Polymerization of VAM is highly exothermic and a rapid release of heat may cause a rapid increase in pressure</p>	

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		<p>Comment: The quotation from Bretherick's Handbook of Reactive Chemical Hazards (2007) is incomplete, the full text is added in track change mode above. Considering the full text, it is clearly stated that "Other peroxides or radical sources will initiate the exothermic polymerisation.", but not peroxides formed from vinyl acetate. Thus a classification as R 19 / EUH019 is not warranted. Comment on the Influence of acetaldehyde impurity: It was shown by Levy (1992) that acetaldehyde impurities do not cause oxygen-induced destabilization of vinyl acetate. Levy incubated vinyl acetate samples with defined acetaldehyde contents under air and under nitrogen for a nine months test period. To one of the samples acetaldehyde was added ("spiked"). The acetaldehyde-spiked samples did not polymerize under either atmosphere. The author states "This rules out the dependence of oxygen's destabilizing effect on acetaldehyde impurity. In fact, the results indicate acetaldehyde to have a significant, stabilizing effect on airblanketed VA." (VA: vinyl acetate)</p> <div data-bbox="622 898 1547 1161" style="background-color: #f0f0f0; padding: 5px;"> <p>pages 9/10 Section 1.3 Physico-chemical properties, Table 1.1 Summary of physico- chemical properties Explosive properties The classification procedure needs not to be applied because there are no chemical groups present in the molecule which are associated with explosive properties. Vinyl acetate, unstabilised, is proposed to classify additionally with R19/EUH019.⁴ Reference: BAM II.2 (2010)</p> </div> <p>Comment: No further details on the reference BAM II.2 (2010) are given in the document. In order to be able to evaluate the contents of this reference as they relate to vinyl acetate properties, Industry would appreciate if the complete citation were made available.</p> <p>REFERENCES</p>	<p>resulting in an uncontrolled release and/or vessel rupture. In our opinion we considered the labelling with R19/EUH019 as necessary to inform about the intrinsic hazardous properties arising from vinyl acetate in a non-stabilised form.</p> <p>The reference BAM II.2 (2010) should be added in the CLH-Report as follows: BAM (2010): Expert judgement by BAM Federal Institute for Materials Research and Testing, Division II.2, Berlin, Germany in 2010.</p>	

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		<p>Barnes, C.E., Eloffson, R.M., Jones, G.D., J. Am. Chem. Soc. 72 (1950) 210. Gustin, J.-L., Laganier, F., "Understanding Vinyl Acetate Polymerization Accidents" Organic Process Research & Development 9 (2005) 962–975. Levy, L.B., Hinojosa Jr., L., "Effect of Oxygen on Vinyl Acetate Polymerization", Journal of Applied Polymer Science, 45 (1992) 1537-1544. Urben, P.G. (Ed.): Bretherick's Handbook of Reactive Chemical Hazards, 7th ed., Elsevier (2007).</p>		