

October 25, 2021

U.S. Environmental Protection Agency Office of Pollution Prevention & Toxics 1200 Pennsylvania Avenue, NW Washington, DC 20460

To Whom It May Concern,

On behalf of Symrise, Inc. I am submitting the Health and Safety Data Report required under TSCA Section 8(d), according to 40 CFR part 716.

Symrise, Inc. is an importer of the high priority chemical 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta [g]-2-benzopyran (HHCB) CAS RN 1222-05-5.

The submission contains a list of unpublished health and safety studies known to Symrise to exist, but to which we do not have possession of study reports.

Should you have any further needs in regards to this submission, please do not hesitate to contact me at any time. Thank you.

Sincerely, Symrise, Inc.

Katherine Wszolkowski

Toxicology Manager

Symrise, Inc I 300 North Street I Teterboro, NJ 07608

Office (973) 774-6140 | Fax (201)-288-0843 | Mobile (201) 257-7719

katherine.wszolkowski@symrise.com

40 CFR 716.21(a)(9) 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta [g]-2-benzopyran (HHCB) CAS RN 1222-05-5

## 40 CFR 716.35 (a)(3) Studies which are known but without possession of copies

## **Symrise AG**

Muehlenfeldstrasse 1 37603 Holzminden Germany

Bayer Industry Services Leverkusen, 1991. Untersuchungen zum ökologischen Verhalten von HR 91/900146, Prüfbericht - Akute Fischtoxizität von HR 91/900146 [Studies on ecological behavior of HR 91/900146, Acute Fish Toxicity with HR 91/900146]. Unpublished report 1991160 in German.

Bayer Industry Services Leverkusen, 1991. Untersuchungen zum ökologischen Verhalten von HR 91/900146, Prüfbericht - Bakterientoxizität von HR 91/900146 [Studies on ecological behavior of HR 91/900146, Respiration Inhibition with HR 91/900146]. Unpublished report 1991161 in German.

Bayer Industry Services Leverkusen, 1991. Untersuchungen zum ökologischen Verhalten von HR 91/900146, Prüfbericht - Biologische Abbaubarkeit von HR 91/900146 [Studies on ecological behavior of HR 91/900146, Ready Biodegradability with HR 91/900146]. Unpublished report 1991234 in German.

# **Research Institute for Fragrance Materials (RIFM)**

50 Tice Blvd Woodcliff Lake, NJ 07677

Api,1999 Research Institute for Fragrance Materials 1999 Evaluation of the oral subchronic toxicity of AHTN and HHCB in the rat. Unpublished report 34482 from Api A.M.; Ford R.A.

Api,1999a Research Institute for Fragrance Materials 1999 Genotoxicity tests with 6-acetyl-1,1,2,4,4,7-hexamethyltetraline and 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8,-hexamethylcyclopenta-gamma-2-benzopyran. Unpublished report 35086 from Api A.M.; San R.H.C.

Api,1999b Research Institute for Fragrance Materials 1999 Evaluation of the oral subchronic toxicity of HHCB (1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran) in the rat. Unpublished report 35129 from Api A.M.; Ford R.A.

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Api,2013a Research Institute for Fragrance Materials 2013 Disposition and excretion of (14)C-AHTN (7-acetyl-1,1,3,4,4,6-hexamethyl- 1,2,3,4-tetrahydronaphthalene) and (14)C-HHCB (1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethyl-cyclopenta- gamma-2-benzopyran) after intravenous administration to Sprague-Dawley rats and domestic pigs. Unpublished report 65007 from Api A.M.; Ritacco G.; Sipes I.G.

Blok,1998 Research Institute for Fragrance Materials 1998 Measurement of polycyclic and nitromusks in sludges of sewage treatment plants in The Netherlands. Report to RIFM. Unpublished report 32223 from Blok J.; Balk F.; Sprenger T.

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Cortes, 2003 Research Institute for Fragrance Materials 2003 Indoor air quality evaluation of a plug-in air freshener. Unpublished report 43292 from Cortes D.; Black M.; Halsey J.

Croudace,1997a Research Institute for Fragrance Materials 1997 HHCB: Chronic toxicity to fathead minnow (Pimephales promelas) embryos & larvae. Report to RIFM. Unpublished report 30173 from Croudace C.P.; Caunter J.E.; Johnson P.A.

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DiFrancesco, 2004 Research Institute for Fragrance Materials 2004 Dissipation of fragrance materials in sludge-amended soils. Unpublished report 43828 from DiFrancesco A.M.; Chiu P.C.; Standley L.J.; Allen H.E.; Salvito D.T.

DiFrancesco, 2005 Research Institute for Fragrance Materials 2005 Partition coefficients and volatilization rates of AHTN and HHCB in sludge. Unpublished report 59630 from DiFrancesco A.; Chiu P.; Allen H.

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Forbes,1978 Research Institute for Fragrance Materials 1978 Phototoxicity and irritation studies of mice and pigs with fragrance materials. Report to RIFM. Unpublished report 2042 from Forbes P.D.; Urbach F.; Davies R.E.

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Gossmann,1997a Research Institute for Fragrance Materials 1997 Effects of HHCB on reproduction and growth of the earthworm Eisenia fetida (Savigny 1826) in artificial soil. Unpublished report 30916 from Gossmann A.; Petto R.

Green,2001c Research Institute for Fragrance Materials 2001 In-vitro human skin penetration of radiolabelled fragrance material HHCB. Unpublished report 38100 from Green D.M.; Brain S.I.

Gudi,1997a Research Institute for Fragrance Materials 1997 Micronucleus cytogenetic assay of HHCB in mice. Report to RIFM. Unpublished report 29489 from Gudi R.; Ritter P.

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Nik,2021b Research Institute for Fragrance Materials 2021 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-γ-2-benzopyran: Repeated Insult Patch Test (RIPT). Unpublished report 77516 from Nik S.A.; Spey D.R.; Ruhl K.K.; Ros A.

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Schneider,2020 Research Institute for Fragrance Materials 2020 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-γ-2-benzopyran (HHCB): A dietary exposure bioaccumulation test with the bluegill sunfish (Lepomis macrochirus). Unpublished report 76882 from Schneider S.Z.; Zhang L.; Martin K.H.; Aufderheide J.A.

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Smith,2004e Research Institute for Fragrance Materials 2004 Exposure characterizations of three fragranced products. Unpublished report 45348 from Smith L.W.; Rogers R.E.; Black M.S.; Isola D.A.

Sonnichsen,1999 Research Institute for Fragrance Materials 1999 Synthetic musk fragrances in human milk. Report to RIFM. Unpublished report 35014 from Sonnichsen C.; Mayer R.; Ommer S.; Koletzko B.

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Zhang,2004 Research Institute for Fragrance Materials 2004 Removal mechanisms for fragrance materials in sludge-amended soils. Unpublished report 45820 from Zhang S.; DiFrancesco A.; Chiu P.; Allen H.; Salvito D.

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#### IFF

600 NJ-36 Hazlet, NJ 07730

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IFF 2016d 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (galaxolide undiluted): Evaluation of acute oral toxicity in rats - acute toxic class method. RIFM Unpublished reference 71173

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International Flavors and Fragrances 2006 Acute immobilisation test of HHCB lactone using Daphnia magna. RIFM Unpublished reference 50408

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International Flavors and Fragrances 1963kk Acute eye irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB)in rabbits. RIFM Unpublished reference 27804

International Flavors and Fragrances 1964dddd Repeated insult patch test with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB)in humans. RIFM Unpublished reference 27805

International Flavors and Fragrances 1973aa Acute eye irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in rabbits. RIFM Unpublished reference 27810

International Flavors and Fragrances 1973bb Repeated insult patch test with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in humans. RIFM Unpublished reference 27811

International Flavors and Fragrances 1973w Acute eye irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in rabbits. RIFM Unpublished reference 27806

International Flavors and Fragrances 1973x Repeated insult patch test with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB in humans. RIFM Unpublished reference 27807

International Flavors and Fragrances 1973y Dermal irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in rabbits. RIFM Unpublished reference 27808

International Flavors and Fragrances 1973z Dermal irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in rabbits. RIFM Unpublished reference 27809

International Flavors and Fragrances 1975aa Dermal irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in rabbits. RIFM Unpublished reference 27812

International Flavors and Fragrances 1975bb Dermal irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in rabbits. RIFM Unpublished reference 27813

International Flavors and Fragrances 1975cc Dermal irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in rabbits. RIFM Unpublished reference 27814

International Flavors and Fragrances 1975dd Acute eye irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in rabbits. RIFM Unpublished reference 27815

International Flavors and Fragrances 1975ee Acute eye irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in rabbits. RIFM Unpublished reference 27816

International Flavors and Fragrances 1975ff Acute eye irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in rabbits. RIFM Unpublished reference 27817

International Flavors and Fragrances 1978n A phototoxicity test of 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in human subjects. RIFM Unpublished reference 15455

International Flavors and Fragrances 1978o A phototoxicity study of 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in human subjects. RIFM Unpublished reference 15456

International Flavors and Fragrances 1978p A phototoxicity test of 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in human subjects. RIFM Unpublished reference 15457

International Flavors and Fragrances 1978q A phototoxicity study of 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in human subjects. RIFM Unpublished reference 15458

International Flavors and Fragrances 1980s Twenty-six week subacute dermal toxicity study in rats. RIFM Unpublished reference 26465

International Flavors and Fragrances 1980t Primary ocular irritation study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB) in rabbits. RIFM Unpublished reference 27818

International Flavors and Fragrances 1998 Fate of HHCB in soil microcosms. RIFM Unpublished reference 31966

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International Flavors and Fragrances 2005o Manometric respirometry test of HHCB lactone. RIFM Unpublished reference 50442

International Flavors and Fragrances 2006a Growth inhibition test of HHCB lactone using selenastrum capricornutum. RIFM Unpublished reference 50409

International Flavors and Fragrances; PFW Aroma Chemcials BV 2005a HHCB and AHTN concentrations in sediment cores of the Teltow Canal in Berlin. RIFM Unpublished reference 55762

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International Flavors and Fragrances; PFW Aroma Chemicals BV 2005b HHCB and AHTN concentration in sediment toxicity tests. RIFM Unpublished reference 55763

International Flavors and Fragrances; PFW; Omegam; Royal Haskoning 2012 Fragrance ingredients in STPs and sediment in Berlin, 2011. RIFM Unpublished reference 63820

#### Givaudan

717 Ridgedale Ave East Hanover, NJ 07936

Givaudan 1980r Irritation test with 4-methyl-3-decen-5-ol (Undecavertol B)on the rabbit eye. RIFM Unpublished reference 49103

Quest International 1977v Determination of the acute oral toxicity of 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-g-2-benzopyran in rats. RIFM Unpublished reference 46092

Quest International 1978eee Comparison of the acute toxicity of 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran; perpetual; and 5-acetyl-3-isopropyl-1,1,2,6-tetramethylindane in rats. RIFM Unpublished reference 49607

Quest International 1980c Phototoxicity tests with 5-acetyl-3-isopropyl-1,1,2,6-tetramethylindane (traseolide) and 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (galaxolide) in albino rabbits. RIFM Unpublished reference 28686

Quest International 1980nnn Guinea pig skin irritation test with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-g-2-benzopyran. RIFM Unpublished reference 46093

Quest International 1981gg Guinea pig skin sensitization test with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-g-2-benzopyran. RIFM Unpublished reference 46094

Quest International 1986 Phototoxicity study with 5-acetyl-3-isopropyl 1,1,2,6-tetramethylindane (traseolide) and 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (galaxolide) in albino rabbits. RIFM Unpublished reference 28690

Quest International 1994ccc Assessment of the inherent biodegradability of 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-g-2-benzopyran IPM in the sealed vessel test using acclimatised effluent. RIFM Unpublished reference 46095

Quest International 1994III The biodegradability of perfume ingredients in the sealed vessel test. RIFM Unpublished reference 49699

#### Avon

One Liberty Plaza 165 Broadway New York, NY 10006

Avon Products, Inc. 1976d A comparative study of a perfume compound containing 7-acetyl-6-ethyl-1,1,4,4-tetramethyl-1,2,3,4-tetrahydronaphthaline (AETT) versus a perfume compound containing 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta (HHCB) in female rats. RIFM Unpublished reference 13595

Avon Products, Inc. 1976h An evaluation of the ability of various musk chemicals to produce the blue color phenomenon in female rats. RIFM Unpublished reference 13599

Avon Products, Inc. 1977f Comparative acute toxicity studies in the female rat with five synthetic musk chemicals. RIFM Unpublished reference 13611

#### P&G

One Procter & Gamble Plaza Cincinnati, OH 45202

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## **PFW Aroma Chemicals**

Veemweg 29-31 Barneveld Gelderland Netherlands 3771 MT

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## Shiseido

390 Madison Avenue, New York, NY 10017

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### Unilever

800 Sylvan Ave Englewood Cliffs, NJ 07632

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