



Michal Freedhoff
Assistant Administrator
Office of Chemical Safety and Pollution Prevention
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Dear Dr. Freedhoff:

Enclosed please find Firmenich Incorporated's submission under 40 CFR 716.21(a)(9) for HHCB; CAS (1222-05-5). Specifically, the Health and Safety Data Reporting Rule, promulgated pursuant to TSCA section 8(d), that requires manufacturers (including importers) of certain chemical substances to submit lists and copies of certain unpublished health and safety studies to EPA.

Firmenich does not possess copies of any studies, does not know of any ongoing studies and has not commissioned any studies for HHCB or any materials subject to this rule. None of the below items are applicable to Firmenich:

- ii. A list of the specified types of health and safety studies that are ongoing at the time the chemical substance is listed and are being conducted by or for them.
- iii. A list of the specified types of health and safety studies that are initiated after the date the chemical substance is listed and will be conducted by or for them.
- iv. A copy of each specified type of health and safety study which is in their possession at the time the chemical substance is listed.
- v. A copy of each specified type of health and safety study that was previously listed as ongoing or subsequently initiated (i.e., listed in accordance with reporting requirements in Unit III.B.2.iii. and iv., respectively) and is now complete--regardless of completion date.

The below is a list of studies that are known to Firmenich but not within its possession. The studies are listed by Company Name.

- i. A list of the specified types of health and safety studies known to them but not in their possession at the time the chemical substance is listed



Please let us know if Firmenich can be of further assistance.

Sincerely yours,

John Carey

Regulatory Director
Firmenich, Incorporated

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 (3) Studies which are known but without possession of copies

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. Unpublished Ref# 13595

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 Unpublished Ref# 13599

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 Unpublished Ref# 13611

Givaudan

717 Ridgedale Ave
East Hanover, NJ 07936

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Givaudan 1980r Irritation test with 4-methyl-3-decen-5-ol (Undecavertol B) on the rabbit eye. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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 acclimated effluent. Unpublished Ref# 46095

Quest International 1994lll The biodegradability of perfume ingredients in the sealed vessel test. Unpublished Ref# 49699

IFF

600 NJ-36
Hazlet, NJ 07730

IFF 2016c 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (galaxolide undiluted): Evaluation of acute dermal toxicity in rats. Unpublished. null Ref# 71172

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. Unpublished. null Ref# 71173

Bush Boake Allen Ltd. 1998 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (Abbalide): Assessment of ready biodegradability by manometric respirometry. Unpublished Ref# 32878

Bush Boake Allen, Inc. 1991a 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-delta-2-benzopyran: Assessment of its ready biodegradability. Unpublished Ref# 33596

IFF 1972n Microbial attributes test. Unpublished Ref# 14993

IFF Incorporated 1997d Biodegradation studies of HHCB assessment of a two stage fungal/soil treatment. Unpublished Ref# 40991

IFF Incorporated 2004l 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran: A study on the toxicity to the sediment dweller *Hyalella azteca*. Unpublished Ref# 47758

IFF Incorporated 2004m 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran: A study on the toxicity to the aquatic oligochaete *Lumbriculus variegatus*. Unpublished Ref# 47759

IFF Incorporated 2004n 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran: A study on the toxicity to the sediment dweller *Chironomus riparius*. Unpublished Ref# 47760

International Flavors and Fragrances 2006 Acute immobilisation test of HHCB lactone using *Daphnia magna*. Unpublished Ref# 50408

International Flavors and Fragrances 1963jj Guinea pig sensitization study with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB). Unpublished Ref# 27803

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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 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. Unpublished Ref# 15458

International Flavors and Fragrances 1980s Twenty-six week subacute dermal toxicity study in rats. Unpublished Ref# 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. Unpublished Ref# 27818

International Flavors and Fragrances 1998 Fate of HHCB in soil microcosms. Unpublished Ref# 31966

International Flavors and Fragrances 2000v Acute toxicity of 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran 64.5% (Galaxolide 50)w/w in DEP to *Scenedesmus subspicatus*. Unpublished Ref# 53945

International Flavors and Fragrances 2000w Acute toxicity of 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-?-2-benzopyran 64.5% (Galaxolide 50) w/w in DEP to *Scenedesmus subspicatus*. Unpublished Ref# 53946

International Flavors and Fragrances 2005o Manometric respirometry test of HHCB lactone. Unpublished Ref# 50442

International Flavors and Fragrances 2006a Growth inhibition test of HHCB lactone using *selenastrum capricornutum*. Unpublished Ref# 50409

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

International Flavors and Fragrances; PFW Aroma Chemicals BV 2005 AHTN and HHCB in sewage treatment plants in Southern Europe and in Berlin. Unpublished Ref# 55761

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

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

P&G

One Procter & Gamble Plaza
Cincinnati, OH 45202

Procter & Gamble Company 2003 Biodegradation of 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-γ-2-benzopyran (Galaxolide (HHCB)) in activated sludge. Unpublished Ref# 54269

PFW Aroma Chemicals

Veemweg 29-31
Barneveld
Gelderland
Netherlands
3771 MT

PFW Aroma Chemicals B.V. 1996 Biodegradation of polycyclic musks by micro-organisms. Screening of soil samples and investigation of pure cultures. Unpublished Ref# 42919

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,2002 Research Institute for Fragrance Materials 2002 In vitro human skin penetration of the radiolabelled fragrance materials, AHTN and HHCB. Unpublished report 39631 from Api A.M.; Isola D.A.

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.

Christian,1997 Research Institute for Fragrance Materials 1997 Oral (gavage) developmental toxicity study of 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethyl cyclopenta-gamma-2-benzopyran (HHCB) in rats. Report to RIFM. Unpublished report 31837 from Christian M.S.; Hoberman A.M.; Parker R.M.

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.

Curry,1995a Research Institute for Fragrance Materials 1995 In vitro mammalian cytogenetic test with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB). Report to RIFM. Unpublished report 28695 from Curry P.T.; Putman D.L.

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.

Epstein,1974 Research Institute for Fragrance Materials 1974 Report on human maximization studies. Report to RIFM. Unpublished report 1801 from Epstein W.L.

Epstein,1979 Research Institute for Fragrance Materials 1979 Report on human maximization studies. Report to RIFM. Unpublished report 1697 from Epstein W.L.

Federle,2000 Research Institute for Fragrance Materials 2000 Biotransformation of the polycyclic musk, HHCB, in activated sludge and river water. Unpublished report 36193 from Federle T.W.; Langworthy D.E.; Itrich N.R.; Simonich S.L.

Folk,1987 Research Institute for Fragrance Materials 1987 Human phototoxicity study of fragrance materials. Report to RIFM. Unpublished report 5744 from Folk C.M.; Dammers K.S.

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.

Ford,1999b Research Institute for Fragrance Materials 1999 Chronic effects of two polycyclic musks on "Pimephales promelas" and "Brachydanio rerio". Unpublished report 38865 from Ford R.A.; Salvito D.T.

Gabriel,1987a Research Institute for Fragrance Materials 1987 Phototoxicity study in human subjects. Report to RIFM. Unpublished report 5743 from Gabriel K.L.; Mark R.

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.

Harbell,2001 Research Institute for Fragrance Materials 2001 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-g-2-benzopyran: Neutral red uptake phototoxicity assay in Balb/C 3T3 mouse fibroblasts. Report to RIFM. Unpublished report 40274 from Harbell J.W.; Raabe H.A.; Reeves A.; Sizemore A.M.

Harrison,1986 Research Institute for Fragrance Materials 1986 Phototoxicity testing in human subjects. Unpublished report 5748 from Harrison L.B.; Stolman L.P.

Hawkins,1995d Research Institute for Fragrance Materials 1995 (14)C-HHCB - Studies on the dermal absorption in the rat. Report to RIFM. Unpublished report 27625 from Hawkins D.R.; Kirkpatrick D.; Girkin R.

Hawkins,1996e Research Institute for Fragrance Materials 1996 (14)C-HHCB: Investigation of the transfer across the placenta and into milk of rats during and after pregnancy following repeated oral administration. Report to RIFM. Unpublished report 28738 from Hawkins D.R.; Elsom L.F.; Winwick T.; Nicoll S.A.

Hawkins,1996f Research Institute for Fragrance Materials 1996 (14)C-HHCB - dermal absorption in man. Unpublished report 28838 from Hawkins D.R.; Kirkpatrick D.; Girkin R.; Brooker M.D.

Hawkins,1997 Research Institute for Fragrance Materials 1997 (14)C-HHCB absorption, distribution and excretion in rats after single intravenous doses. Report to RIFM. Unpublished report 29699 from Hawkins D.R.; Girkin R.; Elsom L.F.

Haynes,1984 Research Institute for Fragrance Materials 1984 Primary irritation test in rabbits. Report to RIFM. Unpublished report 1795 from Haynes G.

Haynes,1985 Research Institute for Fragrance Materials 1985 Primary irritation test in rabbits. Report to RIFM. Unpublished report 3099 from Haynes G.

Haynes,1986 Research Institute for Fragrance Materials 1986 Primary irritation test in rabbits. Report to RIFM. Unpublished report 5664 from Haynes G.; Trenchard-Morgan S.

Hopkins,1996a Research Institute for Fragrance Materials 1996 13-Week oral (dietary) toxicity study of HHCB in the rat with a 4 week treatment period. Addendum attached. Report to RIFM. Unpublished report 28070 from Hopkins M.N.; Canning M.; Wright J.A.; Lambert A.H.; Trenchard-Morgan S.

Isola,2003 Research Institute for Fragrance Materials 2003 Exposure characterization from a fragranced plug-in air freshener. Unpublished report 41705 from Isola D.; Smith L.W.; Ansari R.; Black M.S.

Isola,2003a Research Institute for Fragrance Materials 2003 Exposure characterization of fragranced air fresheners. Unpublished report 43878 from Isola D.A.; Smith L.W.; Rogers R.E.; Black M.S.

Isola,2004 Research Institute for Fragrance Materials 2004 Exposure characterization from a surrogate fine fragrance. Unpublished report 44448 from Isola D.A.; Rogers R.E.; Myshaniuk A.; Jeng C.-J.; Ansari R.; Smith L.W.

Jones,1996b Research Institute for Fragrance Materials 1996 HHCB: Effects on peri- and post natal development including maternal function in the rat (Gavage administration). Report to RIFM. Unpublished report 28737 from Jones K.; Bottomley A.M.; Gopinath C.

Kirkpatrick,1997a Research Institute for Fragrance Materials 1997 (14)C-HHCB - An investigation of the volatilization of radioactivity following a simulated dermal application. Report to RIFM. Unpublished report 29825 from Dean G.M.; Kirkpatrick D.; Mellor S.J.

Kirkpatrick,1997c Research Institute for Fragrance Materials 1997 (14)C-HHCB - Assessment of the fate of a fragrance chemical in the pig after intravenous administration. Report to RIFM. Unpublished report 30511 from Kirkpatrick D.; Elsom L.F.; Girkin R.; Redgrave V.A.

Kirkpatrick,1998 Research Institute for Fragrance Materials 1998 HHCB - Metabolite profiles in rat and pig urine. Report to RIFM. Unpublished report 32550 from Kirkpatrick D.; Girkin R.; Elsom L.F.; Ridgers R.J.

Klepka,1997a Research Institute for Fragrance Materials 1997 Effects of HHCB on reproduction of the springtail *Folsomia candida* in artificial soil. Report to RIFM. Unpublished report 30914 from Klepka S.; Petto R.

Larsen,2006 Research Institute for Fragrance Materials 2006 Effects of the sediment-associated fragrance material, HHCB, on the infaunal marine polychaete *capitella* sp. I. Unpublished report 57131 from Larsen T.; Salvito D.; Forbes V.

Mills,1997b Research Institute for Fragrance Materials 1997 Evaluation of human photoallergy of 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyrane (HHCB) by repeated insult patch test. Report to RIFM. Unpublished report 30625 from Mills O.H.

Moreno,1975 Research Institute for Fragrance Materials 1975 Acute toxicity studies on rats, rabbits and guinea pigs. Report to RIFM. Unpublished report 2020 from Moreno O.M.

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.

Ramskov,2009 Research Institute for Fragrance Materials 2009 Individual- and population-level effects of the synthetic musk, HHCB, on the deposit-feeding polychaete, capitella sp. I. Unpublished report 57125 from Ramskov T.; Selck H.; Salvito D.; Forbes V.E.

Rogers,2003a Research Institute for Fragrance Materials 2003 Airborne levels of selected fragrance materials in a simulated bathroom. Unpublished report 41708 from Rogers R.E.; Jeng C-J.

Rogers,2004 Research Institute for Fragrance Materials 2004 Airborne levels of selected fragrance materials following a controlled exposure to a surrogate fine fragrance. Unpublished report 47425 from Rogers R.E.

San,1994a Research Institute for Fragrance Materials 1994 Salmonella/Escherichia coli plate incorporation mutagenicity assay with a confirmatory assay with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB). Report to RIFM. Unpublished report 28692 from San R.C.; Klug M.L.; Wagner III V.O.

San,1994c Research Institute for Fragrance Materials 1994 Unscheduled DNA synthesis assay in rat primary hepatocytes with 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran (HHCB). Report to RIFM. Unpublished report 28694 from San R.H.C.; Sly J.E.

Schaefer,2005 Research Institute for Fragrance Materials 2005 (14)C-HHCB: Dieaway of a semi-volatile organic compound in river water. Unpublished report 45689 from Wildlife International, Ltd.

Schaefer,2009 Research Institute for Fragrance Materials 2009 (14)C-HHCB: Removal and/or biodegradation of a semi-volatile organic compound in an activated sludge simulation system. Unpublished report 56067 from Schaefer E.C.; Koper C.M.

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.

Seinen,1997 Research Institute for Fragrance Materials 1997 Estrogenicity of AHTN and HHCB in mice. RIFM report number 31715

Shanahan,1987 Research Institute for Fragrance Materials 1987 Phototoxicity testing in human subjects. Report to RIFM. Unpublished report 5752 from Shanahan R.W.; Alworth K.

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.

Wolf,1996c Research Institute for Fragrance Materials 1996 Influence of HHCB on the reproduction of *Daphnia magna*. Report to RIFM. Unpublished report 27681 from Wolf P.U.; Wuthrich V.

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