

# [Docosahexaenoic acid c22h32o2 structure](https://assignbuster.com/docosahexaenoic-acid-c22h32o2-structure/)

Contents

* Retention Index (Linear):

|  |  |
| --- | --- |
| Molecular Formula  | C 22 H 32 O 2  |
| Average mass  | 328. 488 Da  |
| Density  | 0. 9±0. 1 g/cm 3  |
| Boiling Point  | 446. 7±24. 0 °C at 760 mmHg  |
| Flash Point  | 343. 4±18. 0 °C  |
| Molar Refractivity  | 105. 9±0. 3 cm 3  |
| Polarizability  | 42. 0±0. 5 10 -24 cm 3  |
| Surface Tension  | 36. 0±3. 0 dyne/cm  |
| Molar Volume  | 348. 0±3. 0 cm 3  |

* Experimental data
* Predicted – ACD/Labs
* Predicted – EPISuite
* Predicted – ChemAxon
* Experimental Physico-chemical Properties

## Experimental Melting Point:

|  |
| --- |
| -44 °CIndofine[10-2206],[10-2206]  |
| -44 °CIndofine[10-2206],[10-2206],[10-2206]  |

## Experimental Solubility:

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| --- |
| Soluble to 100 mM in DMSOTocris Bioscience3687  |
| Soluble to 100 mM in DMSO and to 100 mM in ethanolTocris Bioscience3687  |

* Miscellaneous

## Bio Activity:

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| --- |
| Endogenous omega-3 fatty acid. Acts as a selective retinoid X receptor (RXR) agonist that displays no activity at RAR, thyroid hormone receptor or the vitamin D receptor (VDR). Activates all three RXR isoforms. Also shown to inhibit A? 1-42 fibrillation and toxicity in vitro. Tocris Bioscience3687  |
| Endogenous omega-3 fatty acid. Acts as a selective retinoid X receptor (RXR) agonist that displays no activity at RAR, thyroid hormone receptor or the vitamin D receptor (VDR). Activates all three RXRisoforms. Also shown to inhibit A? 1-42 fibrillation and toxicity in vitro. Tocris Bioscience3687  |
| Nuclear ReceptorsTocris Bioscience3687  |
| Retinoid X ReceptorTocris Bioscience3687  |
| RXR agonistTocris Bioscience3687  |

* Gas Chromatography

## Retention Index (Kovats):

|  |
| --- |
| 2612 (estimated with error: 51)NIST Spectramainlib\_333235  |

## Retention Index (Normal Alkane):

|  |
| --- |
| 2501. 9 (Program type: Ramp; Column cl… (show more)ass: Semi-standard non-polar; Column diameter: 0. 25 mm; Column length: 30 m; Column type: Capillary; Heat rate: 5 K/min; Start T: 130 C; End T: 250 C; CAS no: 6217545; Active phase: DB-5; Carrier gas: He; Data type: Normal alkane RI; Authors: Jalali-Heravi, M.; Vosough, M., Characterization and determination of fatty acids in fish oil using gas chromatography-mass spectrometry coupled with chemometric resolution techniques, J. Chromatogr. A, 1024, 2004, 165-176.)NIST Spectranist ri  |

## Retention Index (Linear):

|  |
| --- |
| 2520. 9 (Program type: Complex; Column… (show more)class: Semi-standard non-polar; Column diameter: 0. 25 mm; Column length: 30 m; Column type: Capillary; Description: Multi-step temperature program; T(initial)= 60C; T(final)= 270C; CAS no: 6217545; Active phase: VF-5MS; Carrier gas: He; Phase thickness: 0. 25 um; Data type: Linear RI; Authors: Tret’yakov, K. V., Retention Data. NIST Mass Spectrometry Data Center., 2007.)NIST Spectranist ri  |

Predicted data is generated using the ACD/Labs Percepta Platform – PhysChem Module

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| --- | --- |
| Density:  | 0. 9±0. 1 g/cm 3  |
| Boiling Point:  | 446. 7±24. 0 °C at 760 mmHg  |
| Vapour Pressure:  | 0. 0±2. 3 mmHg at 25°C  |
| Enthalpy of Vaporization:  | 77. 3±6. 0 kJ/mol  |
| Flash Point:  | 343. 4±18. 0 °C  |
| Index of Refraction:  | 1. 521  |
| Molar Refractivity:  | 105. 9±0. 3 cm 3  |
| #H bond acceptors:  | 2  |
| #H bond donors:  | 1  |
| #Freely Rotating Bonds:  | 14  |
| #Rule of 5 Violations:  | 1  |

|  |  |
| --- | --- |
| ACD/LogP:  | 6. 78  |
| ACD/LogD (pH 5. 5):  | 5. 20  |
| ACD/BCF (pH 5. 5):  | 3070. 59  |
| ACD/KOC (pH 5. 5):  | 5789. 98  |
| ACD/LogD (pH 7. 4):  | 3. 39  |
| ACD/BCF (pH 7. 4):  | 48. 25  |
| ACD/KOC (pH 7. 4):  | 90. 98  |
| Polar Surface Area:  | 37 Å 2  |
| Polarizability:  | 42. 0±0. 5 10 -24 cm 3  |
| Surface Tension:  | 36. 0±3. 0 dyne/cm  |
| Molar Volume:  | 348. 0±3. 0 cm 3  |

Predicted data is generated using the US Environmental Protection Agency’s EPISuite™

 Log Octanol-Water Partition Coef (SRC): Log Kow (KOWWIN v1. 67 estimate) = 8. 62Boiling Pt, Melting Pt, Vapor Pressure Estimations (MPBPWIN v1. 42): Boiling Pt (deg C): 449. 90 (Adapted Stein & Brown method)Melting Pt (deg C): 164. 24 (Mean or Weighted MP)VP(mm Hg, 25 deg C): 1. 83E-008 (Modified Grain method)Subcooled liquid VP: 4. 94E-007 mm Hg (25 deg C, Mod-Grain method)Water Solubility Estimate from Log Kow (WSKOW v1. 41): Water Solubility at 25 deg C (mg/L): 0. 0009028log Kow used: 8. 62 (estimated)no-melting pt equation usedWater Sol Estimate from Fragments: Wat Sol (v1. 01 est) = 0. 0089926 mg/LECOSAR Class Program (ECOSAR v0. 99h): Class(es) found: Surfactants-anionic-acidHenrys Law Constant (25 deg C) [HENRYWIN v3. 10]: Bond Method : 7. 33E-005 atm-m3/moleGroup Method: 9. 74E-008 atm-m3/moleHenrys LC [VP/WSol estimate using EPI values]: 8. 762E-006 atm-m3/moleLog Octanol-Air Partition Coefficient (25 deg C) [KOAWIN v1. 10]: Log Kow used: 8. 62 (KowWin est)Log Kaw used: -2. 523 (HenryWin est)Log Koa (KOAWIN v1. 10 estimate): 11. 143Log Koa (experimental database): NoneProbability of Rapid Biodegradation (BIOWIN v4. 10): Biowin1 (Linear Model) : 0. 7723Biowin2 (Non-Linear Model) : 0. 6965Expert Survey Biodegradation Results: Biowin3 (Ultimate Survey Model): 3. 1362 (weeks )Biowin4 (Primary Survey Model) : 4. 0284 (days )MITI Biodegradation Probability: Biowin5 (MITI Linear Model) : 0. 3860Biowin6 (MITI Non-Linear Model): 0. 1165Anaerobic Biodegradation Probability: Biowin7 (Anaerobic Linear Model): -0. 0488Ready Biodegradability Prediction: NOHydrocarbon Biodegradation (BioHCwin v1. 01): Structure incompatible with current estimation method! Sorption to aerosols (25 Dec C)[AEROWIN v1. 00]: Vapor pressure (liquid/subcooled): 6. 59E-005 Pa (4. 94E-007 mm Hg)Log Koa (Koawin est ): 11. 143Kp (particle/gas partition coef. (m3/ug)): Mackay model : 0. 0455 Octanol/air (Koa) model: 0. 0341 Fraction sorbed to airborne particulates (phi): Junge-Pankow model : 0. 622 Mackay model : 0. 785 Octanol/air (Koa) model: 0. 732 Atmospheric Oxidation (25 deg C) [AopWin v1. 92]: Hydroxyl Radicals Reaction: OVERALL OH Rate Constant = 346. 7017 E-12 cm3/molecule-sec [Cis-isomer]OVERALL OH Rate Constant = 392. 3017 E-12 cm3/molecule-sec [Trans-isomer]Half-Life = 22. 212 Min (12-hr day; 1. 5E6 OH/cm3) [Cis-isomer]Half-Life = 19. 631 Min (12-hr day; 1. 5E6 OH/cm3) [Trans-isomer]Ozone Reaction: OVERALL Ozone Rate Constant = 78. 000000 E-17 cm3/molecule-sec [Cis-]OVERALL Ozone Rate Constant = 120. 000000 E-17 cm3/molecule-sec [Trans-]Half-Life = 21. 157 Min (at 7E11 mol/cm3) [Cis-isomer]Half-Life = 13. 752 Min (at 7E11 mol/cm3) [Trans-isomer]Reaction With Nitrate Radicals May Be Important! Fraction sorbed to airborne particulates (phi): 0. 703 (Junge, Mackay)Note: the sorbed fraction may be resistant to atmospheric oxidationSoil Adsorption Coefficient (PCKOCWIN v1. 66): Koc : 1. 351E+005Log Koc: 5. 131 Aqueous Base/Acid-Catalyzed Hydrolysis (25 deg C) [HYDROWIN v1. 67]: Rate constants can NOT be estimated for this structure! Bioaccumulation Estimates from Log Kow (BCFWIN v2. 17): Log BCF from regression-based method = 1. 000 (BCF = 10)log Kow used: 8. 62 (estimated)Volatilization from Water: Henry LC: 9. 74E-008 atm-m3/mole (estimated by Group SAR Method)Half-Life from Model River: 1. 09E+004 hours (454 days)Half-Life from Model Lake : 1. 19E+005 hours (4959 days)Removal In Wastewater Treatment: Total removal: 94. 03 percentTotal biodegradation: 0. 78 percentTotal sludge adsorption: 93. 25 percentTotal to Air: 0. 00 percent(using 10000 hr Bio P, A, S)Level III Fugacity Model: Mass Amount Half-Life Emissions(percent) (hr) (kg/hr)Air 0. 00914 0. 239 1000 Water 3. 75 360 1000 Soil 28. 2 720 1000 Sediment 68. 1 3. 24e+003 0 Persistence Time: 1. 24e+003 hr

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