

MICROBICS MICROTOX® TOXICITY TEST

TEST SUBSTANCE

Identity: Perfluorooctanoic acid, ammonium salt; may also be referred to as PFOA ammonium salt, Ammonium perfluorooctanoate, PFO, FC-116, FC-126, FC-169, FC-143 or as the major component of FC-118. (Octanoic acid, pentadecafluoro-, ammonium salt, CAS # 3825-26-1)

Remarks: The test sample is FC-118. It's purity was not sufficiently characterized, though current information indicates is 20% FC-143 in 80% water. The 3M product lot number was not noted.

The following summary applies to the test sample as a mixture of the test substance in water solution with incompletely characterized concentrations of impurities. Data may not accurately relate toxicity of the test sample with that of the test substance.

METHOD:

Method: Microbics Microtox® "BASIC" Procedure

Test type: Static acute

GLP: No

Year Completed: 1996

Species: *Photobacterium phosphoreum*

Analytical monitoring: pH and osmotic condition

Exposure period: 30-minutes

Statistical methods: EC50 values calculated by statistical linear regression program provided for Microtox®

Test organism source: Microbics' Reagent.

Test conditions:

Diluent: Millipore Milli-Q™ water

Stock and test solution preparation: A primary 10 g/L stock solution was prepared in Millipore Milli-Q™ water. The pH of the stock solution was 6.0 (no adjustment) and an osmotic adjustment was made using 200 mg NaCl in 10 mL stock solution. Appearance of test solutions was noted as "clear and colorless". All test solutions were made by proportional dilutions.

Exposure vessels: 3 mL Cuvettes.

Number of replicates: two

Number of concentrations: Four plus a blank control

Element basis: Percent light loss.

RESULTS

Nominal concentrations: Blank control, 625, 1250, 2500, and 5000 mg/L
Element value: 5-minute EC₅₀ = 4460 (4020 – 4950) mg/L
15-minute EC₅₀ = 3360 (3090 – 3641) mg/L
30-minute EC₅₀ = 3150 (2910 – 3420) mg/L

Element values based on nominal concentrations.

Remarks: Testing was conducted on the mixture of the test substance as described in the test substance remarks field. The values reported apply to that mixture and not the test substance.

CONCLUSIONS

The FC-118 30-minute EC₅₀ for *Photobacterium phosphoreum* was determined to be 3150 mg/L with a 95% Confidence Interval of 2910 to 3420 mg/L.

Submitter: 3M Company, Environmental Laboratory, P.O. Box 33331, St. Paul, MN, 55133

DATA QUALITY

Reliability: Klimisch ranking 2. Testing meets all criteria for quality testing, but lacks analytical confirmation of test substance concentrations. There is a lack of characterization of the test sample.

REFERENCES

This study was conducted by the 3M Environmental Laboratory, St. Paul, Minnesota, Lab Request number P1626.

OTHER

Last changed: 5/25/00

ENVIRONMENTAL LABORATORY: MICROTOX PREP SHEET

LR: P1626-3
Date: 4-24-96
Analyst: T45
pg 9 of 12

TEST SUBSTANCE: FC-118

1. Preparation of Stock Solution

- * Mass/Vol. Test Substance: 1.0g/100ml
- * Final Dilution Volume: 10g/L
- * Diluent: Milli-Q Water
- * Final Concentration of Stock Solution: 10g/L

2. pH Adjustment of Stock Solution

- * Initial pH of Stock Solution: 6.0
- * pH Adjusted to: ---
- * pH Adjusted with: ---

3. Osmotic Adjustment of Stock Solution

- * Osmotic Adjuster: NaCl
- * Comments: 10ml of stock soln was added to 200mg NaCl

4. Appearance of pH and Osmotically Adjusted Stock Solution

CLEAR or OPAQUE (circle one)

- * Color: clear
- * Comments: _____

5. Comments

Test Time: 15 minutes

Osmotic Adjustment: NaCl

Time: 15 minutes		Osmotic Adjustment (NAI)			
NUMBER	IG/IT	COND.	OR/GAMMA	% Light Loss	mean % Light Loss
Control	96.44/ 79.14	0.0	0.8206 #	—	—
Control	95.87/ 77.90	0.0	0.8299 #	—	—
1	99.39/ 60.13	0.0000000	0.360	26.5	26.0
2	92.97/ 57.67	0.0000000	0.344	26.6	
3	89.17/ 59.40	1000.00000	0.257	19.2	23.9
4	63.40/ 54.98	1250.00000	0.402	28.7	
5	92.43/ 49.45	2500.00000	0.543 #	35.2	35.3
6	87.29/ 45.77	2500.00000	0.574 #	36.5	
7	93.59/ 25.05	5000.00000	2.059 #	67.3	68.8
8	91.30/ 20.43	5000.00000	2.262 #	70.2	

CR = CORRECTION FACTOR = 0.021
(used for calculations)

#000008691 NG/L (95% CONFIDENCE RANGE : 3093.7686 TO 3641.2141)

Signature _____

Rudy Steffenhagen

TEST DATE: 4-24-96

7142

$$* = \frac{\text{gamma}}{(\text{gamma} + 1)} \times 100$$

10 *****

3SLOPE = 1.9827

G
A
M
M
A

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 84

1000 CONCENTRATION 10E4

FBI LABORATORY COMBUSTION LOG # 0-9014 x 104 p 6-7-82

100-44407-61A-6350

COEFFICIENT OF DETERMINATION: $R^2 = 0.9941$

004032

pg 11 of 12
LR # P1626-3

MICROTOX DATA REPORT
Basic Test

FILE FC-118.K15
P1626

Test Time: 15 minutes

Osmotic Adjustment: NaCl

| NUMBER | IG/IT | CONC. | CR/GAMMA | av Light Loss (%) | mean % Light Loss |
|---------|--------------|-----------|----------|-------------------|-------------------|
| Control | 76.44/ 79.14 | 0.0 | 0.8206 # | — | — |
| Control | 93.87/ 77.90 | 0.0 | 0.8299 # | — | — |
| 1 | 99.39/ 50.77 | 1000.0000 | 0.360 | 26.5 | 26.0 |
| 2 | 92.97/ 57.07 | 1000.0000 | 0.344 | 26.6 | |
| 3 | 89.12/ 59.45 | 1000.0000 | 0.257 | 19.2 | 23.9 |
| 4 | 93.40/ 54.58 | 1250.0000 | 0.402 | 28.7 | |
| 5 | 92.43/ 49.40 | 2500.0000 | 0.543 # | 35.2 | 35.3 |
| 6 | 87.29/ 45.77 | 2500.0000 | 0.574 # | 36.5 | |
| 7 | 93.59/ 25.05 | 5000.0000 | 2.059 # | 67.3 | 68.8 |
| 8 | 91.35/ 22.43 | 5000.0000 | 2.362 # | 70.2 | |

CR = CORRECTION FACTOR = 0.0255
Used for calculations

EC50 = 1591.591 NG/L (95% CONFIDENCE LIMITS: 1095.7686 TO 3641.2141)

Signature *Rudy Stupfel*

TEST DATE: 4-24-96

* = gamma x 100
(gamma + 1)



ESTIMATED EQUATION: $y = 0.0014x + 1.6$ $R^2 = 0.92$
95% CONFIDENCE LIMITS: 1.00287, 0.01130
DETERMINATION COEFFICIENT: 0.92

pg 12 of 12
LR # P1626-3

MICROTOX DATA REPORT Basic Test

FILE FC-118.K30
P1626

Test Time: 30 minutes

Osmotic Adjustment: NaCl

| NUMBER | IO/IT | CONC. | CR/GAMMA | % Light
Loss | Mean
Light
Loss |
|---------|--------------|-----------|----------|-----------------|-----------------------|
| Control | 96.44/ 77.64 | 0.0 | 0.8053 # | — | — |
| Control | 93.87/ 77.22 | 0.0 | 0.8226 # | — | — |
| 1 | 99.39/ 57.95 | 425.0000 | 0.396 | 28.4 | 27 |
| 2 | 92.97/ 54.97 | 575.0000 | 0.377 | 27.4 | |
| 3 | 89.12/ 58.95 | 1050.0000 | 0.331 | 18.8 | 23 |
| 4 | 93.40/ 54.07 | 1250.0000 | 0.405 | 28.9 | |
| 5 | 92.43/ 47.51 | 2500.0000 | 0.584 # | 36.9 | 38 |
| 6 | 87.29/ 43.23 | 5000.0000 | 0.643 # | 39.1 | |
| 7 | 93.59/ 31.74 | 5000.0000 | 1.504 # | 58.7 | 71.5 |
| 8 | 91.35/ 19.35 | 5000.0000 | 2.804 # | 73.7 | 72 |

CR = CORRECTION FACTOR = 0.514
Used for calculations

FC-1184.3713 MG/L (95% CONFIDENCE) (BASE: 2712.8491 TO 3415.9187)

Signature *Judy Slupenka*

TEST DATE: 4-24-96

$\gamma = \frac{\text{gamma}}{(\text{gamma} + 1)}$ X 10

