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## Two generation reproductive toxicity study of Nonylphenol by oral administration in rats


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Table 1

Two generation reproductive toxicity study of NP by oral administration in rats

Clinical signs of $F_0$ males

| Dose (mg/kg) | Clinical signs | No. of animals showing clinical signs | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Weeks of treatment | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | Days of treatment | 1–7 | 8–14 | 15–21 | 22–28 | 29–35 | 36–42 | 43–49 | 50–56 | 57-63 | 64-70 | 71–77 | 78–84 |
| 0 | Loss of teeth | 0/35 | 0/35 | 0/35 | 0/35 | 0/35 | 0/35 | 0/35 | 0/35 | 0/35 | 0/35 | 0/35 | 0/35 |
| 2 | Loss of teeth | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 0/25 | 0/25 | 0/25 |
| | Crust formation (bracium) | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| | Crust formation (back) | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| | Crust formation (neck) | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| 10 | Loss of teeth | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 0/25 | 0/25 |
| | Crust formation (around left eye) | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| | Loss of hair (around left eye) | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| 50 | Salivation | 5/25 | 13/25 | 11/25 | 16/25 | 18/25 | 20/25 | 20/25 | 21/25 | 17/25 | 22/25 | 21/25 | 21/25 |
| | Reddish tear | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |

Table 1 (Continued)

Two generation reproductive toxicity study of NP by oral administration in rats

Clinical signs of $F_0$ males

| Dose (mg/kg) | Clinical signs | No. of animals showing clinical signs | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Weeks of treatment | 13 | 14 | 15 | 16 | 17 | 18 | Total |
| | | Days of treatment | 85－91 | 92－98 | 99－105 | 106-112 | 113-119 | 120-126 | |
| 0 | Loss of teeth | | 0/35 | 0/35 | 0/35 | 1/35 | 0/35 | 0/35 | 1/35 |
| 2 | Loss of teeth | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 |
| | Crust formation (bracium) | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 |
| | Crust formation (back) | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 |
| | Crust formation (neck) | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 |
| 10 | Loss of teeth | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 |
| | Crust formation (around left eye) | | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 |
| | Loss of hair (around left eye) | | 0/25 | 1/25 | 1/25 | 0/25 | 0/25 | 0/25 | 1/25 |
| 50 | Salivation | | 21/25 | 21/25 | 18/25 | 17/25 | 20/25 | 6/25 | 25/25 |
| | Reddish tear | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 |

Table 1 (Continued)

Two generation reproductive toxicity study of NP by oral administration in rats

Clinical signs of $F_0$ males

| Dose (mg/kg) | Clinical signs | No. of animals showing clinical signs | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Weeks of treatment | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Total |
| | Days of treatment | 1–7 | 8–14 | 15–21 | 22–28 | 29–35 | 36–42 | 43–49 | 50–56 | 57-63 | 64-70 | 71–77 | 78–84 | 85–91 | 92–98 | |
| 250 | Salivation | 25/25 | 25/25 | 25/25 | 25/25 | 25/25 | 25/25 | 25/25 | 25/25 | 24/24 | 23/23 | 23/23 | 22/23 | 20/21 | 8/10 | 25/25 |
| | Loose stool | 0/25 | 0/25 | 6/25 | 5/25 | 9/25 | 6/25 | 5/25 | 3/25 | 2/24 | 1/23 | 1/23 | 1/23 | 3/21 | 3/10 | 20/25 |
| | Decrease in stool | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 0/25 | 0/25 | 1/25 | 1/24 | 0/23 | 0/23 | 1/23 | 2/21 | 1/10 | 5/25 |
| | Soiled hair | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 1/25 | 1/24 | 0/23 | 0/23 | 3/23 | 1/23 | 3/10 | 9/25 |
| | Emaciation | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/24 | 0/23 | 0/23 | 2/23 | 2/23 | 1/10 | 6/25 |
| | Listless | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/24 | 0/23 | 0/23 | 0/23 | 2/23 | 1/10 | 4/25 |
| | Small testes(palpation) | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 3/25 | 2/24 | 1/23 | 1/23 | 1/23 | 0/23 | 0/10 | 3/25 |
| | Piloerection | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/24 | 0/23 | 0/23 | 1/23 | 1/23 | 0/10 | 2/25 |
| | Crust formation | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 0/25 | 0/24 | 0/23 | 0/23 | 0/23 | 0/23 | 0/10 | 1/25 |
| | Loss of hair | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/24 | 0/23 | 0/23 | 0/23 | 1/23 | 1/10 | 2/25 |
| | Hypothermia | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/24 | 0/23 | 0/23 | 0/23 | 2/23 | 1/10 | 3/25 |
| | Soiled hair (perioral) | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/24 | 0/23 | 0/23 | 0/23 | 1/23 | 0/10 | 2/25 |
| | Crust formation(nose) | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 1/25 | 0/25 | 0/25 | 0/24 | 0/23 | 0/23 | 0/23 | 0/23 | 0/10 | 1/25 |
| | Diarrhea | 0/25 | 0/25 | 1/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/24 | 0/23 | 0/23 | 0/23 | 1/23 | 1/10 | 3/25 |
| | Loss of hair(neck) | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/24 | 0/23 | 0/23 | 0/23 | 0/23 | 0/10 | 1/25 |
| | (perioal) | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/24 | 1/23 | 1/23 | 1/23 | 1/23 | 0/10 | 1/25 |
| | (hindlib) | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/24 | 0/23 | 0/23 | 0/23 | 0/23 | 0/10 | 1/25 |
| | (scrotum,femur) | )0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 1/25 | 1/24 | 1/23 | 1/23 | 0/23 | 0/23 | 0/10 | 1/25 |
| | (right,femur ) | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 1/24 | 0/23 | 0/23 | 0/23 | 2/23 | 1/10 | 3/25 |
| | Moribundity | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 1/24 | 0/23 | 0/23 | 2/23 | 1/23 | 1/10 | 5/25 |

Table 2

Two generation reproductive toxicity study of NP by oral administration in rats

Body weight of Fo males during treatment period; Mean±S.D. (N)

| Compound | Nonylphenol | | | | |
|---|---|---|---|---|---|
| Dose (mg/kg) | 0[a] | 2 | 10 | 50 | 250 |
| Days of treatment | | | | | |
| 1 | 235.1 ± 10.3 ( 35) | 245.8 ± 7.2 **( 25) | 231.4 ± 8.6 ( 25) | 231.5 ± 9.1 ( 25) | 231.4 ± 9.2 ( 25) |
| 4 | 256.6 ± 12.3 ( 35) | 265.6 ± 9.0 **( 25) | 252.5 ± 10.2 ( 25) | 253.0 ± 11.5 ( 25) | 247.4 ± 10.2 **( 25) |
| 8 | 285.3 ± 14.9 ( 35) | 292.9 ± 11.6 ( 25) | 280.3 ± 14.0 ( 25) | 280.2 ± 13.9 ( 25) | 273.5 ± 13.2 **( 25) |
| 11 | 304.0 ± 17.3 ( 35) | 313.1 ± 13.2 ( 25) | 298.3 ± 17.1 ( 25) | 297.1 ± 17.4 ( 25) | 287.4 ± 14.8 **( 25) |
| 15 | 327.8 ± 21.3 ( 35) | 336.4 ± 16.0 ( 25) | 319.5 ± 21.6 ( 25) | 319.2 ± 22.0 ( 25) | 301.6 ± 16.5 **( 25) |
| 18 | 343.1 ± 24.1 ( 35) | 352.3 ± 18.4 ( 25) | 334.4 ± 24.2 ( 25) | 331.9 ± 25.3 ( 25) | 310.9 ± 17.9 **( 25) |
| 22 | 364.2 ± 27.0 ( 35) | 371.5 ± 22.3 ( 25) | 356.0 ± 27.6 ( 25) | 351.9 ± 29.5 ( 25) | 324.7 ± 19.4 **( 25) |
| 25 | 377.2 ± 28.9 ( 35) | 386.7 ± 25.4 ( 25) | 368.8 ± 30.5 ( 25) | 363.8 ± 32.2 ( 25) | 331.1 ± 21.6 **( 25) |
| 29 | 395.6 ± 31.6 ( 35) | 404.0 ± 25.5 ( 25) | 387.9 ± 33.7 ( 25) | 382.9 ± 35.7 ( 25) | 344.0 ± 23.2 **( 25) |
| 32 | 407.9 ± 33.1 ( 35) | 420.7 ± 28.2 ( 25) | 399.3 ± 36.8 ( 25) | 392.7 ± 38.1 ( 25) | 351.6 ± 22.3 **( 25) |
| 36 | 424.3 ± 35.0 ( 35) | 439.5 ± 30.0 ( 25) | 416.2 ± 40.2 ( 25) | 411.0 ± 41.9 ( 25) | 362.4 ± 25.3 **( 25) |
| 39 | 433.7 ± 37.2 ( 35) | 449.4 ± 30.8 ( 25) | 425.8 ± 43.8 ( 25) | 419.0 ± 42.8 ( 25) | 368.2 ± 25.4 **( 25) |
| 43 | 446.5 ± 38.1 ( 35) | 465.3 ± 33.2 ( 25) | 439.4 ± 44.6 ( 25) | 431.8 ± 46.2 ( 25) | 372.3 ± 29.3 **( 25) |
| 46 | 456.4 ± 40.7 ( 35) | 473.0 ± 33.1 ( 25) | 446.9 ± 47.8 ( 25) | 439.3 ± 48.2 ( 25) | 377.6 ± 29.7 **( 25) |
| 50 | 468.6 ± 43.1 ( 35) | 486.5 ± 35.7 ( 25) | 458.9 ± 49.0 ( 25) | 450.4 ± 51.7 ( 25) | 379.5 ± 34.6 **( 25) |
| 53 | 475.6 ± 43.9 ( 35) | 492.1 ± 36.7 ( 25) | 468.2 ± 53.0 ( 25) | 457.7 ± 52.8 ( 25) | 384.1 ± 41.4 **( 25) |
| 57 | 487.1 ± 44.5 ( 35) | 507.8 ± 37.4 ( 25) | 479.0 ± 53.3 ( 25) | 467.6 ± 54.8 ( 25) | 391.7 ± 33.4 **( 24) |
| 60 | 492.7 ± 45.8 ( 35) | 514.2 ± 37.4 ( 25) | 486.2 ± 52.2 ( 25) | 473.5 ± 55.1 ( 25) | 396.2 ± 40.2 **( 24) |

a: vehicle control, corn oil (2 mL/kg)

**: Significant difference from control, $p<0.01$

Table 2 (continued)

Two generation reproductive toxicity study of NP by oral administration in rats

Body weight of Fo males during treatment period; Mean±S.D. (N)

| Compound | Nonylphenol | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dose (mg/kg) | 0[a] | | 2 | | 10 | | 50 | | 250 | |
| Days of treatment | | | | | | | | | | |
| 64 | 503.8 ± 46.7 | ( 35) | 526.6 ± 39.3 | ( 25) | 492.0 ± 57.0 | ( 25) | 481.3 ± 57.1 | ( 25) | 405.7 ± 32.0 ** | ( 23) |
| 67 | 506.9 ± 48.1 | ( 35) | 532.0 ± 40.0 | ( 25) | 495.4 ± 56.9 | ( 25) | 485.7 ± 57.7 | ( 25) | 406.0 ± 31.8 ** | ( 23) |
| 71 | 516.8 ± 48.7 | ( 35) | 543.2 ± 41.2 | ( 25) | 503.4 ± 56.8 | ( 25) | 493.4 ± 57.3 | ( 25) | 411.6 ± 34.9 ** | ( 23) |
| 74 | 520.1 ± 50.9 | ( 35) | 546.8 ± 42.3 | ( 25) | 505.0 ± 58.8 | ( 25) | 495.2 ± 56.5 | ( 25) | 405.8 ± 30.7 ** | ( 23) |
| 78 | 528.8 ± 51.4 | ( 35) | 556.6 ± 43.1 | ( 25) | 517.3 ± 59.5 | ( 25) | 502.8 ± 58.6 | ( 25) | 410.3 ± 42.1 ** | ( 23) |
| 81 | 533.0 ± 52.0 | ( 35) | 560.8 ± 44.3 | ( 25) | 519.0 ± 62.2 | ( 25) | 504.8 ± 59.1 | ( 25) | 411.2 ± 38.1 ** | ( 22) |
| 85 | 539.0 ± 52.5 | ( 35) | 569.5 ± 45.3 | ( 25) | 529.3 ± 60.7 | ( 25) | 511.3 ± 60.6 | ( 25) | 412.2 ± 47.0 ** | ( 22) |
| 88 | 537.6 ± 52.9 | ( 35) | 568.3 ± 46.6 | ( 25) | 527.3 ± 60.1 | ( 25) | 508.3 ± 59.8 | ( 25) | 426.4 ± 35.6 ** | ( 19) |
| 92 | 544.7 ± 53.7 | ( 35) | 573.9 ± 46.9 | ( 25) | 532.9 ± 59.2 | ( 25) | 515.3 ± 62.5 | ( 25) | 388.5 ± 37.1 ** | ( 10) |
| 95 | 550.7 ± 55.1 | ( 35) | 580.2 ± 48.1 | ( 25) | 538.6 ± 59.4 | ( 25) | 519.8 ± 61.1 | ( 25) | | |
| 99 | 556.9 ± 55.4 | ( 35) | 585.4 ± 50.5 | ( 25) | 544.9 ± 60.5 | ( 25) | 525.4 ± 63.1 | ( 25) | | |
| 102 | 560.4 ± 57.1 | ( 35) | 589.8 ± 51.6 | ( 25) | 548.9 ± 60.9 | ( 25) | 528.1 ± 64.7 | ( 25) | | |
| 106 | 566.2 ± 57.1 | ( 35) | 596.2 ± 53.6 | ( 25) | 554.2 ± 61.2 | ( 25) | 533.7 ± 64.6 | ( 25) | | |
| 109 | 570.4 ± 58.6 | ( 35) | 599.7 ± 53.8 | ( 25) | 558.7 ± 61.9 | ( 25) | 537.0 ± 65.8 | ( 25) | | |
| 113 | 576.3 ± 58.2 | ( 35) | 606.2 ± 55.5 | ( 25) | 564.1 ± 63.2 | ( 25) | 541.2 ± 66.9 | ( 25) | | |
| 116 | 579.9 ± 60.1 | ( 35) | 610.2 ± 55.3 | ( 25) | 566.9 ± 62.5 | ( 25) | 545.0 ± 67.3 | ( 25) | | |
| 120 | 585.4 ± 60.0 | ( 35) | 616.3 ± 57.3 | ( 25) | 574.2 ± 64.2 | ( 25) | 549.7 ± 68.9 | ( 25) | | |

a: vehicle control, corn oil (2 mL/kg)

**: Significant difference from control, $p<0.01$

Table 3

Two generation reproductive toxicity study of NP by oral administration in rats

Body weight gain of F0 males during treatment period; Mean±S.D. (N)

| Compound | Nonylphenol | | | | |
|---|---|---|---|---|---|
| Dose (mg/kg) | 0[a] | 2 | 10 | 50 | 250 |
| Days of treatment | | | | | |
| 1-4 | 21.5 ± 4.3 ( 35) | 19.8 ± 3.7 ( 25) | 21.1 ± 3.7 ( 25) | 21.5 ± 3.5 ( 25) | 16.0 ± 4.0 **( 25) |
| 1-7 | 50.2 ± 7.4 ( 35) | 47.1 ± 7.6 ( 25) | 48.9 ± 7.7 ( 25) | 48.7 ± 6.3 ( 25) | 42.1 ± 5.7 **( 25) |
| 1-11 | 68.9 ± 10.1 ( 35) | 67.3 ± 10.2 ( 25) | 66.8 ± 10.7 ( 25) | 65.6 ± 9.6 ( 25) | 56.0 ± 8.1 **( 25) |
| 1-15 | 92.6 ± 14.1 ( 35) | 90.6 ± 13.2 ( 25) | 88.0 ± 15.7 ( 25) | 87.7 ± 14.4 ( 25) | 70.2 ± 9.9 **( 25) |
| 1-18 | 108.0 ± 17.0 ( 35) | 106.5 ± 15.4 ( 25) | 103.0 ± 18.4 ( 25) | 100.4 ± 18.1 ( 25) | 79.5 ± 12.6 **( 25) |
| 1-22 | 129.1 ± 19.7 ( 35) | 125.7 ± 19.1 ( 25) | 124.6 ± 21.8 ( 25) | 120.4 ± 22.6 ( 25) | 93.3 ± 14.9 **( 25) |
| 1-25 | 142.0 ± 21.9 ( 35) | 140.9 ± 22.4 ( 25) | 137.4 ± 24.8 ( 25) | 132.4 ± 25.1 ( 25) | 99.7 ± 18.0 **( 25) |
| 1-29 | 160.5 ± 24.8 ( 35) | 158.2 ± 22.7 ( 25) | 156.5 ± 28.3 ( 25) | 151.4 ± 28.6 ( 25) | 112.6 ± 19.6 **( 25) |
| 1-32 | 172.8 ± 25.9 ( 35) | 174.9 ± 25.3 ( 25) | 167.9 ± 31.5 ( 25) | 161.2 ± 30.8 ( 25) | 120.2 ± 19.1 **( 25) |
| 1-36 | 189.2 ± 28.0 ( 35) | 193.7 ± 27.1 ( 25) | 184.8 ± 35.0 ( 25) | 179.5 ± 34.4 ( 25) | 131.0 ± 21.7 **( 25) |
| 1-39 | 198.6 ± 30.1 ( 35) | 203.6 ± 28.4 ( 25) | 194.4 ± 38.6 ( 25) | 187.5 ± 35.3 ( 25) | 136.8 ± 22.3 **( 25) |
| 1-43 | 211.4 ± 31.5 ( 35) | 219.5 ± 30.8 ( 25) | 207.9 ± 39.4 ( 25) | 200.3 ± 38.7 ( 25) | 140.9 ± 26.8 **( 25) |
| 1-46 | 221.3 ± 33.5 ( 35) | 227.2 ± 30.7 ( 25) | 215.5 ± 42.7 ( 25) | 207.8 ± 40.6 ( 25) | 146.2 ± 26.9 **( 25) |
| 1-50 | 233.5 ± 36.2 ( 35) | 240.7 ± 33.0 ( 25) | 227.5 ± 44.0 ( 25) | 218.9 ± 44.1 ( 25) | 148.1 ± 33.1 **( 25) |
| 1-53 | 240.5 ± 37.1 ( 35) | 246.3 ± 33.8 ( 25) | 236.8 ± 48.2 ( 25) | 226.3 ± 45.4 ( 25) | 152.7 ± 40.1 **( 25) |
| 1-57 | 251.9 ± 37.5 ( 35) | 262.0 ± 34.6 ( 25) | 247.6 ± 48.4 ( 25) | 236.2 ± 47.2 ( 25) | 160.5 ± 31.1 **( 24) |
| 1-60 | 257.5 ± 39.0 ( 35) | 268.4 ± 34.7 ( 25) | 254.7 ± 47.5 ( 25) | 242.1 ± 47.6 ( 25) | 165.0 ± 38.0 **( 24) |

a: vehicle control, corn oil (2 mL/kg)

**: Significant difference from control, $p<0.01$

Table 3 (continued)

Two generation reproductive toxicity study of NP by oral administration in rats

Body weight gain of F0 males during treatment period; Mean±S.D. (N)

| Compound | Nonylphenol | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dose (mg/kg) | 0[a] | | 2 | | 10 | | 50 | | 250 | |
| Days of treatment | | | | | | | | | | |
| 1-64 | 268.7 ± 40.0 | ( 35) | 280.8 ± 36.7 | ( 25) | 260.5 ± 51.7 | ( 25) | 249.9 ± 49.6 | ( 25) | 174.8 ± 28.3 ** | ( 23) |
| 1-67 | 271.8 ± 41.2 | ( 35) | 286.2 ± 37.2 | ( 25) | 263.9 ± 51.4 | ( 25) | 254.2 ± 50.3 | ( 25) | 175.1 ± 28.8 ** | ( 23) |
| 1-71 | 281.6 ± 41.8 | ( 35) | 297.4 ± 38.8 | ( 25) | 272.0 ± 51.5 | ( 25) | 262.0 ± 49.8 | ( 25) | 180.6 ± 31.7 ** | ( 23) |
| 1-74 | 285.0 ± 44.1 | ( 35) | 301.0 ± 39.7 | ( 25) | 273.5 ± 53.9 | ( 25) | 263.8 ± 49.2 | ( 25) | 174.8 ± 27.7 ** | ( 23) |
| 1-78 | 293.6 ± 44.6 | ( 35) | 310.8 ± 40.7 | ( 25) | 285.9 ± 54.5 | ( 25) | 271.3 ± 51.2 | ( 25) | 179.4 ± 41.2 ** | ( 23) |
| 1-81 | 297.8 ± 45.2 | ( 35) | 315.0 ± 41.9 | ( 25) | 287.5 ± 57.5 | ( 25) | 273.3 ± 51.9 | ( 25) | 180.9 ± 34.4 ** | ( 21) |
| 1-85 | 303.9 ± 45.6 | ( 35) | 323.7 ± 43.0 | ( 25) | 297.8 ± 55.9 | ( 25) | 279.9 ± 53.2 | ( 25) | 181.9 ± 43.9 ** | ( 21) |
| 1-88 | 302.5 ± 46.0 | ( 35) | 322.5 ± 44.3 | ( 25) | 295.8 ± 55.2 | ( 25) | 276.8 ± 52.4 | ( 25) | 195.8 ± 30.5 ** | ( 18) |
| 1-92 | 309.6 ± 47.0 | ( 35) | 328.1 ± 44.7 | ( 25) | 301.5 ± 54.5 | ( 25) | 283.8 ± 55.1 | ( 25) | 159.8 ± 30.7 ** | ( 10) |
| 1-95 | 315.6 ± 48.2 | ( 35) | 334.3 ± 45.9 | ( 25) | 307.1 ± 54.5 | ( 25) | 288.4 ± 53.6 | ( 25) | | |
| 1-99 | 321.8 ± 48.6 | ( 35) | 339.6 ± 48.4 | ( 25) | 313.5 ± 55.5 | ( 25) | 294.0 ± 55.5 | ( 25) | | |
| 1-102 | 325.3 ± 50.1 | ( 35) | 344.0 ± 49.4 | ( 25) | 317.4 ± 56.0 | ( 25) | 296.6 ± 57.0 | ( 25) | | |
| 1-106 | 331.1 ± 50.1 | ( 35) | 350.4 ± 51.5 | ( 25) | 322.8 ± 56.1 | ( 25) | 302.2 ± 57.1 | ( 25) | | |
| 1-109 | 335.3 ± 51.4 | ( 35) | 353.9 ± 51.8 | ( 25) | 327.2 ± 57.1 | ( 25) | 305.5 ± 58.2 | ( 25) | | |
| 1-113 | 341.1 ± 51.1 | ( 35) | 360.4 ± 53.6 | ( 25) | 332.7 ± 58.2 | ( 25) | 309.7 ± 59.4 | ( 25) | | |
| 1-116 | 344.7 ± 52.9 | ( 35) | 364.4 ± 53.3 | ( 25) | 335.5 ± 57.5 | ( 25) | 313.5 ± 59.7 | ( 25) | | |
| 1-120 | 350.2 ± 52.8 | ( 35) | 370.5 ± 55.3 | ( 25) | 342.7 ± 59.3 | ( 25) | 318.2 ± 61.4 | ( 25) | | |

a: vehicle control, corn oil (2 mL/kg)

**: Significant difference from control, $p<0.01$

Table 4

Two generation reproductive toxicity study of NP by oral administration in rats

Food consumption of $F_0$ males during treatment period; Mean±S.D. (N)

| Compound | Nonylphenol | | | | |
|---|---|---|---|---|---|
| Dose (mg/kg) | 0[a] | 2 | 10 | 50 | 250 |
| Days of treatment | | | | | |
| 1-2 | 24.5 ± 2.5 ( 35) | 25.2 ± 1.7 ( 25) | 24.2 ± 1.6 ( 25) | 24.8 ± 2.2 ( 25) | 20.9 ± 2.4 **( 25) |
| 4-5 | 24.8 ± 2.5 ( 35) | 25.9 ± 2.1 ( 25) | 24.6 ± 2.3 ( 25) | 24.6 ± 2.4 ( 25) | 23.6 ± 2.1 ( 25) |
| 8-9 | 24.6 ± 2.8 ( 35) | 26.2 ± 2.1 * ( 25) | 23.8 ± 2.5 ( 25) | 23.8 ± 2.4 ( 25) | 23.1 ± 2.4 ( 25) |
| 11-12 | 25.2 ± 2.6 ( 35) | 25.7 ± 2.5 ( 25) | 24.0 ± 2.9 ( 25) | 24.2 ± 2.4 ( 25) | 23.9 ± 2.8 ( 25) |
| 15-16 | 24.8 ± 2.7 ( 35) | 25.7 ± 2.1 ( 25) | 23.6 ± 2.5 ( 25) | 23.6 ± 3.1 ( 25) | 23.8 ± 2.8 ( 25) |
| 18-19 | 25.6 ± 3.1 ( 35) | 25.5 ± 3.1 ( 25) | 24.5 ± 2.4 ( 25) | 23.9 ± 3.1 ( 25) | 23.5 ± 3.4 * ( 25) |
| 22-23 | 25.6 ± 3.1 ( 35) | 27.6 ± 2.7 ( 25) | 25.1 ± 2.8 ( 25) | 26.1 ± 3.8 ( 25) | 24.1 ± 3.1 ( 25) |
| 25-26 | 25.9 ± 3.5 ( 35) | 26.3 ± 5.5 ( 25) | 24.8 ± 3.4 ( 25) | 24.8 ± 3.5 ( 25) | 24.2 ± 4.5 ( 25) |
| 29-30 | 25.9 ± 3.2 ( 35) | 26.5 ± 2.7 ( 25) | 25.3 ± 2.7 ( 25) | 26.5 ± 3.0 ( 25) | 25.1 ± 3.1 ( 25) |
| 32-33 | 26.1 ± 3.1 ( 35) | 26.7 ± 2.5 ( 25) | 25.0 ± 3.5 ( 25) | 25.5 ± 3.2 ( 25) | 23.7 ± 4.4 * ( 25) |
| 36-37 | 25.6 ± 2.9 ( 35) | 26.9 ± 2.1 ( 25) | 25.7 ± 3.5 ( 25) | 25.0 ± 3.3 ( 25) | 22.9 ± 4.0 * ( 25) |
| 39-40 | 26.6 ± 3.5 ( 35) | 28.0 ± 2.8 ( 25) | 24.4 ± 3.3 ( 25) | 25.6 ± 4.0 ( 25) | 22.2 ± 6.1 **( 25) |
| 43-44 | 26.0 ± 3.3 ( 35) | 26.5 ± 2.6 ( 25) | 24.1 ± 2.8 ( 25) | 25.3 ± 3.8 ( 25) | 24.1 ± 3.8 ( 25) |
| 45-46 | 24.9 ± 3.2 ( 35) | 26.9 ± 2.8 ( 25) | 24.7 ± 3.4 ( 25) | 24.9 ± 3.8 ( 25) | 24.6 ± 4.2 ( 25) |
| 50-51 | 25.3 ± 3.4 ( 35) | 26.5 ± 2.9 ( 25) | 24.8 ± 3.7 ( 25) | 25.5 ± 3.4 ( 25) | 23.3 ± 6.7 ( 25) |
| 53-54 | 25.0 ± 3.6 ( 35) | 27.1 ± 2.6 * ( 25) | 23.9 ± 3.1 ( 25) | 24.5 ± 3.2 ( 25) | 21.1 ± 6.3 * ( 25) |
| 57-58 | 24.7 ± 3.7 ( 35) | 26.7 ± 3.1 ( 25) | 24.0 ± 2.7 ( 25) | 24.8 ± 3.7 ( 25) | 23.3 ± 5.7 ( 24) |

a: vehicle control, corn oil (2 mL/kg)

*: Significant difference from control, $p<0.05$

**: Significant difference from control, $p<0.01$

Table 4 (continued)

Two generation reproductive toxicity study of NP by oral administration in rats

Food consumption of Fo males during treatment period; Mean±S.D. (N)

| Compound | Nonylphenol | | | | |
|---|---|---|---|---|---|
| Dose (mg/kg) | 0[a] | 2 | 10 | 50 | 250 |
| Days of treatment | | | | | |
| 60-61 | 24.5 ± 3.2 ( 35) | 27.0 ± 3.0 * ( 25) | 23.7 ± 2.9 ( 25) | 25.7 ± 3.8 ( 25) | 22.8 ± 5.7 ( 24) |
| 64-65 | 24.1 ± 3.0 ( 35) | 25.9 ± 2.6 ( 25) | 23.4 ± 6.0 ( 25) | 24.8 ± 3.2 ( 25) | 24.8 ± 4.3 ( 23) |
| 67-68 | 24.4 ± 3.5 ( 35) | 26.9 ± 2.8 * ( 25) | 23.2 ± 3.2 ( 25) | 23.9 ± 3.7 ( 25) | 26.4 ± 8.1 ( 23) |
| 71-72 | 23.1 ± 3.3 ( 35) | 24.3 ± 2.6 ( 25) | 23.4 ± 3.2 ( 25) | 24.1 ± 3.7 ( 25) | 22.4 ± 4.3 ( 23) |
| 74-75 | 23.7 ± 3.3 ( 35) | 26.0 ± 2.4 * ( 25) | 23.6 ± 3.1 ( 25) | 23.1 ± 4.0 ( 25) | 27.5 ± 9.0 ( 23) |
| 78-79 | 23.6 ± 2.9 ( 35) | 26.4 ± 2.9 * ( 25) | 23.8 ± 3.1 ( 25) | 23.5 ± 4.5 ( 25) | 22.7 ± 8.3 ( 22) |
| 81-82 | 23.6 ± 3.7 ( 35) | 26.0 ± 3.7 ( 25) | 23.7 ± 3.2 ( 25) | 23.5 ± 4.0 ( 25) | 23.7 ± 5.1 ( 21) |
| 99-100 | 24.3 ± 5.1 ( 35) | 25.6 ± 3.2 ( 25) | 23.7 ± 2.3 ( 25) | 23.3 ± 3.4 ( 25) | |
| 102-103 | 24.1 ± 4.0 ( 35) | 25.2 ± 2.8 ( 25) | 23.8 ± 2.8 ( 25) | 23.4 ± 3.8 ( 25) | |
| 106-107 | 23.2 ± 3.4 ( 35) | 24.2 ± 2.7 ( 25) | 23.5 ± 3.0 ( 25) | 23.6 ± 4.0 ( 25) | |
| 109-110 | 23.6 ± 2.9 ( 35) | 26.0 ± 3.2 **( 25) | 23.8 ± 2.8 ( 25) | 24.0 ± 3.3 ( 25) | |
| 113-114 | 24.2 ± 3.1 ( 35) | 25.2 ± 2.3 ( 25) | 23.5 ± 2.4 ( 25) | 22.7 ± 2.9 ( 25) | |
| 116-117 | 24.5 ± 3.1 ( 35) | 26.0 ± 2.7 ( 25) | 24.1 ± 2.8 ( 25) | 24.1 ± 3.6 ( 25) | |

a: vehicle control, corn oil (2 mL/kg)

*: Significant difference from control, $p<0.05$

**: Significant difference from control, $p<0.01$