**Evaluating workplace protection factors (WPFs) of different firefighter PPE interface control measures for select volatile organic compounds (VOCs)**

**SUPPLEMENTAL MATERIALS**

**Table S1.** Outside Gear Air Sampling: Abdomen, Breathing Zone, Shin

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Analyte** | **Sampling Location** | **Sample Type** | **N** | **N of NDs** | **Mean** | **Median** | **Range** | **Std. Dev.** |
| Benzene (ppb) | Breathing Zone | Area Air (Active) | 11 | 0 | 240000 | 230000 | 83000 - 430000 | 94000 |
| Abdomen | 11 | 0 | 160000 | 160000 | 69000 - 240000 | 57000 |
| Thigh | 12 | 0 | 140000 | 140000 | 94000 - 190000 | 32000 |
| Toluene (ppb) | Breathing Zone | Area Air (Active) | 11 | 0 | 6400 | 5000 | 1800 - 13000 | 3900 |
| Abdomen | 11 | 0 | 3600 | 3100 | 1200 - 7000 | 1600 |
| Thigh | 12 | 0 | 3100 | 2800 | 1900 - 5100 | 970 |
| Styrene (ppb) | Breathing Zone | Area Air (Active) | 11 | 0 | 7400 | 7000 | 1900 - 16000 | 4300 |
| Abdomen | 11 | 0 | 4400 | 3700 | 1300 - 7700 | 2200 |
| Thigh | 12 | 0 | 3600 | 3200 | 2000 - 5800 | 1400 |
| Naphthalene (ppb) | Breathing Zone | Area Air (Active - Sorbent only) | 10 | 0 | 14000 | 11000 | 6500 - 36000 | 8900 |
| Abdomen | 12 | 0 | 6600 | 7100 | 2500 - 9400 | 2100 |
| Thigh | 11 | 0 | 6500 | 5300 | 2600 - 18000 | 4300 |

**Table S2.** Outside Gear Air Naphthalene: Sorbent vs. Filter Sampling Media

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Analyte** | **Sample Location** | **Sample Type** | **N** | **N of NDs** | **Mean** | **Median** | **Range** | **Std. Dev.** |
| Naphthalene (ug/m3) | Breathing Zone | Area Air (Active - sorbent only) | 10 | 0 | 72000 | 60000 | 34000 - 190000 | 47000 |
| Abdomen | 11 | 0 | 34000 | 37000 | 13000 - 49000 | 11000 |
| Thigh | 11 | 0 | 34000 | 28000 | 14000 - 96000 | 28000 |
| **Analyte** | **Sample Location** | **Sample Type** | **N** | **N of NDs** | **Mean** | **Median** | **Range** | **Std. Dev.** |
| Naphthalene (ug/m3) | Breathing Zone | Area Air (Active - filter only) | 10 | 0 | 5900 | 4800 | 3200 - 15000 | 3400 |
| Abdomen | 11 | 0 | 4300 | 3500 | 940 - 9900 | 2600 |
| Thigh | 11 | 0 | 3400 | 2900 | 2500 - 6600 | 1200 |

**Table S3.** Outside Gear Air Naphthalene: Vapor versus Particulate Phase

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Breathing Zone** | **Abdomen** | **Thigh** |
| **Sorbent (ug/m3)** | 60000 | 37000 | 28000 |
| **Filter (ug/m3)** | 4800 | 3500 | 2900 |
| **Total Naphthalene (ug/m3)** | 65000 | 41000 | 30000 |
|  |   |   |   |
| **% Vapor-phase (sorbent)** | 0.93 | 0.92 | 0.91 |
| **% Particulate-phase (filter)** | 0.07 | 0.08 | 0.09 |

**Table S4.** Under-Gear Air Sampling: Benzene (ppb)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Standard PPE | Hood | Under Gear Air (Passive) | 6 | 190000 | 170000 | 150000 - 260000 | 45000 | 1.2 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 160000 | 140000 | 140000 - 240000 | 39000 | 0.86 |
| Under Gear Air (Active) | 12 | 210000 | 200000 | 100000 - 350000 | 78000 | 0.69 |
| Under Base Layer (Passive) | 11 | 130000 | 150000 | 200 - 220000 | 65000 | 0.92 |
| Pant | Under Gear Air (Passive) | 6 | 54000 | 53000 | 27000 - 77000 | 21000 | 2.6 |
| Under Gear Air (Active) | 10 | 59000 | 55000 | 9800 - 120000 | 38000 | 2.4 |
| Under Base Layer (Passive) | 11 | 62000 | 64000 | 41000 - 91000 | 16000 | 2.4 |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Interface Control PPE | Hood | Under Gear Air (Passive) | 6 | 170000 | 160000 | 150000 - 240000 | 33000 | 1.4 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 160000 | 180000 | 52000 - 220000 | 59000 | 0.92 |
| Under Gear Air (Active) | 12 | 220000 | 200000 | 38000 - 460000 | 130000 | 0.8 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 59000 | 60000 | 29000 - 84000 | 21000 | 2.3 |
| Under Gear Air (Active) | 12 | 59000 | 58000 | 22000 - 92000 | 26000 | 2.5 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Enhanced Interface Control PPE | Hood | Under Gear Air (Passive) | 6 | 180000 | 180000 | 130000 - 230000 | 32000 | 1.3 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 150000 | 160000 | 120000 - 180000 | 22000 | 0.98 |
| Under Gear Air (Active) | 12 | 260000 | 210000 | 100000 - 490000 | 140000 | 0.66 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 61000 | 55000 | 27000 - 120000 | 31000 | 2.6 |
| Under Gear Air (Active) | 12 | 45000 | 34000 | 8900 - 91000 | 32000 | 3.6 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| One-Piece Liner PPE | Hood | Under Gear Air (Passive) | 6 | 160000 | 160000 | 130000 - 180000 | 27000 | 1.3 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 160000 | 150000 | 110000 - 190000 | 26000 | 0.97 |
| Under Gear Air (Active) | 10 | 200000 | 180000 | 22000 - 340000 | 130000 | 0.73 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 98000 | 91000 | 65000 - 160000 | 36000 | 1.5 |
| Under Gear Air (Active) | 11 | 66000 | 66000 | 40000 - 110000 | 25000 | 2.2 |
| Under Base Layer (Passive) |   |   |   |   |   |   |

**Table S5.** Under-Gear Air Sampling: Toluene (ppb)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Standard PPE | Hood | Under Gear Air (Passive) | 6 | 7200 | 6000 | 4400 - 14000 | 3400 | 0.71 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 5600 | 4500 | 3000 - 13000 | 3500 | 0.67 |
| Under Gear Air (Active) | 12 | 4800 | 4300 | 2100 - 7300 | 2000 | 0.72 |
| Under Base Layer (Passive) | 11 | 3900 | 4100 | 38 - 9800 | 2500 | 0.88 |
| Pant | Under Gear Air (Passive) | 6 | 1300 | 1300 | 540 - 2300 | 670 | 2.3 |
| Under Gear Air (Active) | 10 | 1400 | 1100 | 160 - 3600 | 1200 | 2.5 |
| Under Base Layer (Passive) | 11 | 1500 | 1400 | 760 - 2400 | 550 | 2.1 |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Interface Control PPE | Hood | Under Gear Air (Passive) | 6 | 6000 | 5600 | 2900 - 12000 | 3200 | 0.96 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 5200 | 5100 | 930 - 10000 | 3100 | 0.67 |
| Under Gear Air (Active) | 12 | 4600 | 3800 | 720 - 11000 | 3400 | 0.76 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 1400 | 1300 | 760 - 2100 | 620 | 2.0 |
| Under Gear Air (Active) | 12 | 1400 | 1200 | 560 - 2600 | 770 | 2.5 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Enhanced Interface Control PPE | Hood | Under Gear Air (Passive) | 6 | 6200 | 5000 | 3900 - 14000 | 3700 | 0.95 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 4900 | 3900 | 1900 - 11000 | 3200 | 0.79 |
| Under Gear Air (Active) | 12 | 5700 | 3800 | 2400 - 13000 | 4100 | 0.69 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 1500 | 1400 | 710 - 2900 | 760 | 2.2 |
| Under Gear Air (Active) | 12 | 1200 | 840 | 310 - 2600 | 870 | 2.9 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| One-Piece Liner PPE | Hood | Under Gear Air (Passive) | 6 | 5100 | 4500 | 3000 - 9800 | 2400 | 1.1 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 4300 | 3200 | 2200 - 9800 | 2900 | 0.98 |
| Under Gear Air (Active) | 10 | 4100 | 3000 | 340 - 9200 | 3200 | 0.86 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 2200 | 2000 | 1100 - 4000 | 1000 | 1.5 |
| Under Gear Air (Active) | 11 | 1400 | 1400 | 620 - 2700 | 700 | 2.6 |
| Under Base Layer (Passive) |   |   |   |   |   |   |

**Table S6.** Under-Gear Air Sampling: Styrene (ppb)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Standard PPE | Hood | Under Gear Air (Passive) | 6 | 3300 | 2800 | 1800 - 7600 | 2200 | 2.3 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 2300 | 1900 | 680 - 5300 | 1700 | 2.2 |
| Under Gear Air (Active) | 12 | 4200 | 3800 | 1100 - 8400 | 2400 | 1 |
| Under Base Layer (Passive) | 11 | 1500 | 1700 | 14 - 3200 | 1000 | 2.7 |
| Pant | Under Gear Air (Passive) | 6 | 460 | 370 | 150 - 910 | 290 | 8.6 |
| Under Gear Air (Active) | 10 | 580 | 460 | 440 - 1100 | 270 | 5.7 |
| Under Base Layer (Passive) | 11 | 440 | 490 | 160 - 720 | 160 | 10 |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Interface Control PPE | Hood | Under Gear Air (Passive) | 6 | 2300 | 2300 | 490 - 4500 | 1400 | 3 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 2200 | 1900 | 380 - 4500 | 1400 | 1.9 |
| Under Gear Air (Active) | 12 | 3800 | 2700 | 470 - 9000 | 2900 | 1.2 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 590 | 410 | 120 - 1500 | 520 | 6.4 |
| Under Gear Air (Active) | 12 | 610 | 460 | 440 - 1400 | 350 | 6.1 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Enhanced Interface Control PPE | Hood | Under Gear Air (Passive) | 6 | 2800 | 2000 | 1400 - 6400 | 1900 | 2.6 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 1700 | 1500 | 370 - 3400 | 1100 | 2.6 |
| Under Gear Air (Active) | 12 | 4900 | 2500 | 1700 - 11000 | 4100 | 1.3 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 610 | 550 | 220 - 1400 | 410 | 7.3 |
| Under Gear Air (Active) | 12 | 740 | 450 | 430 - 2100 | 660 | 6.1 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| One-Piece Liner PPE | Hood | Under Gear Air (Passive) | 6 | 1600 | 1400 | 1200 - 2600 | 540 | 4.5 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 1200 | 850 | 300 - 3100 | 1000 | 4.5 |
| Under Gear Air (Active) | 10 | 3200 | 2200 | 450 - 7700 | 2800 | 1.6 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 520 | 570 | 150 - 800 | 280 | 6.6 |
| Under Gear Air (Active) | 11 | 540 | 450 | 440 - 970 | 210 | 6.6 |
| Under Base Layer (Passive) |   |   |   |   |   |   |

**Table S7.** Under-Gear Air Sampling: Naphthalene (ppb)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Standard PPE | Hood | Under Gear Air (Passive) | 6 | 5600 | 3300 | 390 - 20000 | 7200 | 4.6 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 2300 | 2500 | 55 - 5500 | 2000 | 2.3 |
| Under Gear Air (Active) | 12 | 2900 | 2700 | 420 - 7000 | 2300 | 2.6 |
| Under Base Layer (Passive) | 11 | 690 | 720 | 21 - 2300 | 690 | 12 |
| Pant | Under Gear Air (Passive) | 6 | 38 | 32 | 21 - 76 | 22 | 160 |
| Under Gear Air (Active) | 10 | 61 | 62 | 60 - 62 | 1.0 | 120 |
| Under Base Layer (Passive) | 11 | 26 | 21 | 21 - 68 | 14 | 220 |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Interface Control PPE | Hood | Under Gear Air (Passive) | 6 | 2300 | 1800 | 180 - 5900 | 2200 | 15 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 1000 | 1100 | 59 - 2000 | 830 | 4.6 |
| Under Gear Air (Active) | 12 | 2200 | 2200 | 340 - 4200 | 1700 | 5.9 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 57 | 28 | 21 - 190 | 65 | 250 |
| Under Gear Air (Active) | 12 | 61 | 61 | 60 - 63 | 1.4 | 95 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| Enhanced Interface Control PPE | Hood | Under Gear Air (Passive) | 6 | 3400 | 3400 | 310 - 6400 | 2400 | 4.5 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 180 | 100 | 21 - 420 | 170 | 57 |
| Under Gear Air (Active) | 12 | 3100 | 1600 | 61 - 8000 | 3300 | 3.7 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 86 | 26 | 21 - 390 | 150 | 260 |
| Under Gear Air (Active) | 12 | 62 | 61 | 59 - 71 | 4.2 | 88 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| **Condition** | **Sampling Location** | **Sample Type** | **N** | **Mean** | **Median** | **Range** | **Std. Dev.** | **Median WPF** |
| One-Piece Liner PPE | Hood | Under Gear Air (Passive) | 6 | 860 | 640 | 170 - 2200 | 770 | 21 |
| Under Gear Air (Active) |   |   |   |   |   |   |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Jacket | Under Gear Air (Passive) | 6 | 240 | 160 | 21 - 760 | 280 | 43 |
| Under Gear Air (Active) | 10 | 680 | 290 | 61 - 1900 | 760 | 25 |
| Under Base Layer (Passive) |   |   |   |   |   |   |
| Pant | Under Gear Air (Passive) | 6 | 21 | 21 | 21 - 21 | 0.0 | 280 |
| Under Gear Air (Active) | 11 | 61 | 61 | 59 - 62 | 0.8 | 75 |
| Under Base Layer (Passive) |   |   |   |   |   |   |

**Table S8. WPFs for Benzene calculated using Active/Passive vs. Active/Active sampling**

|  |  |  |  |
| --- | --- | --- | --- |
| **Condition** | **Sampling Location** | **(Active/Passive)** | **WPF (Active/Active)** |
|  |  | **Median WPF** | **Range of WPFs** | **Median WPF** | **Range of WPFs** |
| Standard PPE | Hood | 1.2 | 0.54 - 1.5 |   |   |
| Jacket | 0.86 | 0.81 - 1.8 | 0.69 | 0.56 - 1.5 |
| Pant | 2.6 | 2.2 - 3.8 | 2.4 | 1.4 - 11 |
| Interface Control PPE | Hood | 1.4 | 0.57 - 1.7 |   |   |
| Jacket | 0.92 | 0.63 -2.3 | 0.8 | 0.45 - 3.1 |
| Pant | 2.3 | 1.6 - 4.0 | 2.5 | 1.8 - 4.8 |
| Enhanced Interface Control PPE | Hood | 1.3 | 0.63 - 1.7 |   |   |
| Jacket | 0.98 | 0.71 - 1.3 | 0.66 | 0.42 - 1.1 |
| Pant | 2.6 | 1.4 - 3.8 | 3.6 | 1.8 -12 |
| One-Piece Liner PPE | Hood | 1.3 | 0.66 - 3.2 |   |   |
| Jacket | 0.97 | 0.74 - 1.3 | 0.73 | 0.60 - 7.2 |
| Pant | 1.5 | 1.0 - 2.1 | 2.2 | 1.5 - 3.5 |

**Table S9. WPFs for Toluene calculated using Active/Passive vs. Active/Active sampling**

|  |  |  |  |
| --- | --- | --- | --- |
| **Condition** | **Sampling Location** | **(Active/Passive)** | **WPF (Active/Active)** |
|  |  | **Median WPF** | **Range of WPFs** | **Median WPF** | **Range of WPFs** |
| Standard PPE | Hood | 0.71 | 0.42 - 1.5 |   |   |
| Jacket | 0.67 | 0.46 - 0.94 | 0.72 | 0.49 - 1.5 |
| Pant | 2.3 | 1.9 - 4.0 | 2.5 | 1.3 - 14 |
| Interface Control PPE | Hood | 0.96 | 0.47 - 1.5 |   |   |
| Jacket | 0.67 | 0.45 - 2.5 | 0.76 | 0.51 - 3.7 |
| Pant | 2.0 | 1.4 - 6.1 | 2.5 | 1.7 - 3.9 |
| Enhanced Interface Control PPE | Hood | 0.95 | 0.48 - 1.5 |   |   |
| Jacket | 0.79 | 0.53 - 1.2 | 0.69 | 0.43 - 1.0 |
| Pant | 2.2 | 1.2 - 3.1 | 2.9 | 1.8 - 7.1 |
| One-Piece Liner PPE | Hood | 1.1 | 0.60 |   |   |
| Jacket | 0.98 | 0.59 - 1.2 | 0.86 | 0.63 - 9.0 |
| Pant | 1.5 | 1.2 - 1.9 | 2.6 | 1.5 - 3.6 |

**Table S10. WPFs for Styrene calculated using Active/Passive vs. Active/Active sampling**

|  |  |  |  |
| --- | --- | --- | --- |
| **Condition** | **Sampling Location** | **(Active/Passive)** | **WPF (Active/Active)** |
|  |  | **Median WPF** | **Range of WPFs** | **Median WPF** | **Range of WPFs** |
| Standard PPE | Hood | 2.3 | 0.79 - 2.8 |   |   |
| Jacket | 2.2 | 1.2 - 3.6 | 1.0 | 0.58 - 2.9 |
| Pant | 8.6 | 5.6 - 14 | 5.7 | 4.5 - 7.7 |
| Interface Control PPE | Hood | 3.0 | 1.0 - 10 |   |   |
| Jacket | 1.9 | 1.4 - 7.3 | 1.2 | 0.72 - 7.9 |
| Pant | 6.4 | 3.4 - 44 | 6.1 | 3.7 - 12 |
| Enhanced Interface Control PPE | Hood | 2.6 | 0.97 - 3.6 |   |   |
| Jacket | 2.6 | 1.9 - 7.6 | 1.3 | 0.57 - 1.7 |
| Pant | 7.3 | 3.6 - 9.8 | 6.1 | 2.4 - 12 |
| One-Piece Liner PPE | Hood | 4.5 | 1.3 - 6.3 |   |   |
| Jacket | 4.5 | 2.1 - 9.2 | 1.6 | 0.84 - 7.1 |
| Pant | 6.6 | 5.2 - 17 | 6.6 | 4.5 - 12 |

**Table S11. WPFs for Naphthalene calculated using Active/Passive vs. Active/Active sampling**

|  |  |  |  |
| --- | --- | --- | --- |
| **Condition** | **Sampling Location** | **(Active/Passive)** | **WPF (Active/Active)** |
|  |  | **Median WPF** | **Range of WPFs** | **Median WPF** | **Range of WPFs** |
| Standard PPE | Hood | 4.6 | 0.63 - 32 |   |   |
| Jacket | 2.3 | 1.2 - 130 | 2.6 | 0.50 - 21 |
| Pant | 160 | 80 - 870 | 120 | 62 - 290 |
| Interface Control PPE | Hood | 15 | 1.3 - 39 |   |   |
| Jacket | 4.6 | 2.9 - 100 | 5.9 | 0.89 - 13 |
| Pant | 250 | 20 - 350 | 95 | 61 - 290 |
| Enhanced Interface Control PPE | Hood | 4.5 | 1.4 - 23 |   |   |
| Jacket | 57 | 8.4 - 290 | 3.7 | 0.44 - 99 |
| Pant | 260 | 9.4 - 600 | 88 | 59 - 310 |
| One-Piece Liner PPE | Hood | 21 | 3.2 - 7.6 |   |   |
| Jacket | 43 | 8.9 - 410 | 25 | 3.2 - 140 |
| Pant | 280 | 170 - 870 | 75 | 59 - 310 |

**Figure S1. Calibration curve for NIOSH Method 1501 with the inclusion of naphthalene**

