Colorimetric luminescence-based analysis of chemical warfare agents and simulants using a dual emissive Ir(III)/Eu(III) dyad on a paper matrix.

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Materials and Methods:
Unless otherwise indicated, all reagents and solvents were obtained from commercial suppliers (Sigma–Aldrich, Alfa Aesar, Merck, VWR) and were used without further purification. The Ir.L.Eu dyad and the simulant VO were prepared as previously described. 1,2 The chemical warfare agents 2-[(diisopropylamino)ethyl]-O’ethyl methylphosphonothioate (VX) and O-isopropyl methylphosphonofluoridate (GB) were synthesised in-house, with characterisation data reported previously. 3

Results and Data Analysis:
All photographs were obtained in a UV CM 10 Fluorogenic analysis cabinet (dark box) using a Canon EOS 500D camera with no flash. F-stop: f/5.6, Exposure time: 1/50 sec., ISO Speed: ISO-1600. The paper test strips were irradiated with a Spectroline ultraviolet light at 254 and 365 nm. The dyad paper assays were prepared fresh daily by dipping strips of Whatman 1 filter paper into 1x10⁻³ M solutions of the Ir.L.Eu dyad (MeCN) in a petri dish until completely submerged. Using lower dyad concentrations resulted in little (1x10⁻⁴ M) to no lanthanide-based (1x10⁻⁵ M) luminescence under the Uv-Vis irradiation utilised (Figure S1b). Once removed from the solution the wet paper assays were dried for 1 hour at 30 – 35 °C and test strips with uneven distribution of dyad were discarded. One drop of a neat analyte was placed on a test strip and photographs of the emissive colour response were taken under UV irradiation at multiple time points (blank, immediate response, 30 seconds, 1, 2, 3, 4, 5 minutes and 1 hour). The photographs were taken with the test strips under both 256 and 365 nm. However, this testing methodology was repeated for all chemical warfare agents, simulants and interferents studies. All CWAs and simulants were also tested at varied concentrations (0.1 M, 0.05 M, 0.01 M and 0.001 M in MeCN).

Figure S1: (a) The solution state colour change of the Ir•L•Eu dyad, from the red metal centred Eu(III) emission to the blue Ir(III) emission in the presence of VO, (b) photographs of dyad loaded Whatman 1 filter paper irradiated under 256 nm UV light. Left: 1x10⁻³ M in MeCN, Middle: 1x10⁻⁴ M in MeCN and Right: 1x10⁻⁵ M in MeCN.

A visual comparison of the resulting images taken under 254 and 365 nm UV irradiation demonstrated that a more even colouration was obtained using 254 nm irradiation. These samples also displayed far less discolouration due to residual paper dampness or complex movement on the paper assay than those visualised using 365 nm irradiation. Thus the use of 365 nm UV light for visualisation of the luminescence response was not investigated further.
All images for an individual experiment set (a single concentration of a particular analyte over every time point) were loaded into the software program Fiji. The images were stacked and normalised so that each photo was lined up precisely with the others in the series (including a blank) and the images cropped to focus on the spot (see ESI). The cropped Fiji files were then loaded into the colorimetric program Spot Finder 1.13 (isense). An area in the centre of the first spot (photograph of the immediate response) with the most even colouration was selected for analysis and the averaged RGB data generated. The percentage change in intensity over time (300 seconds) for each RGB colour element at each concentration point was plotted to give a visual representation of the colorimetric changes occurring over the experiment.

**Figure S2:** Photographs of the neat VX at 2 minutes sample under differing UV irradiation wavelength. Left: 365 nm and Right: 256 nm.

**VX, 254 nm**

![Image of VX at 254 nm](image)

**Figure S3:** Normalised photographs of the dyad loaded paper assay with one drop of VX at varied concentrations over time. The image of 5 minute (300 sec) sample at 0.001 M failed or was corrupted and has not been displayed.
Table S1: RGB triplet data generated from the Spotfinder software for the normalised photographs from the VX experiments in Figure S3.

|       | Time | 0    | 17   | 30   | 60   | 120  | 180  | 240  | 300  | 3600 |
|-------|------|------|------|------|------|------|------|------|------|------|
| **Neat** |      |      |      |      |      |      |      |      |      |      |
| Red   | 4080 | 192  | 192  | 192  | 176  | 176  | 160  | 160  | 288  |
| Green | 1408 | 128  | 128  | 128  | 128  | 128  | 128  | 128  | 160  |
| Blue  | 1392 | 176  | 192  | 208  | 208  | 208  | 208  | 192  | 288  |
| **0.1 M** |      |      |      |      |      |      |      |      |      |      |
| Red   | 4080 | 128  | 128  | 96   | 64   | 48   | 48   | 48   | 192  |
| Green | 1328 | 144  | 144  | 288  | 576  | 656  | 656  | 672  | 880  |
| Blue  | 1152 | 288  | 256  | 592  | 1200 | 1328 | 1344 | 1360 | 1712 |
| **0.05 M** |      |      |      |      |      |      |      |      |      |      |
| Red   | 4080 | 112  | 128  | 128  | 160  | 128  | 112  | 96   | 160  |
| Green | 1184 | 144  | 128  | 512  | 688  | 752  | 736  | 752  | 912  |
| Blue  | 1008 | 304  | 256  | 1104 | 1424 | 1504 | 1504 | 1744 |
| **0.01 M** |      |      |      |      |      |      |      |      |      |      |
| Red   | 4080 | 432  | 528  | 1120 | 1552 | 1616 | 1680 | 1744 | 2816 |
| Green | 1280 | 192  | 192  | 816  | 1136 | 1152 | 1168 | 1168 | 1008 |
| Blue  | 1056 | 384  | 368  | 1616 | 2112 | 2112 | 2112 | 2096 | 1680 |
| **0.001 M** |      |      |      |      |      |      |      |      |      |      |
| Red   | 4080 | 1072 | 1168 | 1728 | 3296 | 3312 | 3312 | 3360 | 3360 |
| Green | 1344 | 304  | 288  | 288  | 800  | 832  | 832  | 960  |
| Blue  | 1392 | 608  | 576  | 544  | 1328 | 1360 | 1376 | 1536 |

Figure S4: Colorimetric time response profiles over 5 minutes (300 seconds) by percentage change in each of the R, G and B colour components for VX at varied concentrations.
Figure S5: Normalised photographs of the dyad loaded paper assay with one drop of GB at varied concentrations over time.

Table S2: RGB triplet data generated from the Spotfinder software for the normalised photographs from the GB experiments in Figure S5.

|       | 0  | 11 | 30 | 60 | 120 | 180 | 240 | 300 | 3600 |
|-------|----|----|----|----|-----|-----|-----|-----|------|
| Neat  |    |    |    |    |     |     |     |     |      |
| Red   | 4080 | 2416 | 2512 | 2592 | 2624 | 2544 | 2512 | 2448 | 1312 |
| Green | 1440 | 880  | 1088 | 1184 | 1344 | 1520 | 1728 | 1872 | 3392 |
| Blue  | 1232 | 1568 | 1904 | 2080 | 2320 | 2560 | 2848 | 3056 | 4080 |
|       | 0  | 11 | 30 | 60 | 120 | 180 | 240 | 300 | 3600 |
| Red   | 4080 | 1072 | 800 | 496 | 1648 | 1616 | 1632 | 1584 | 1664 |
| Green | 1424 | 640  | 848 | 1680 | 3440 | 3456 | 3456 | 3456 | 3472 |
| Blue  | 1184 | 1280 | 1712 | 2848 | 4080 | 4080 | 4080 | 4080 | 4080 |
|       | 0  | 11 | 30 | 60 | 120 | 180 | 240 | 300 | 3600 |
| Red   | 4080 | 2160 | 1392 | 832 | 1248 | 1248 | 1232 | 1232 | 1248 |
| Green | 1344 | 720  | 944 | 1232 | 3152 | 3168 | 3152 | 3168 | 3232 |
| Blue  | 1200 | 1344 | 1840 | 2320 | 4064 | 4064 | 4064 | 4064 | 4064 |
|       | 0  | 20 | 30 | 60 | 120 | 180 | 240 | 300 | 3600 |
| Red   | 4080 | 3040 | 2880 | 3472 | 4080 | 4080 | 4080 | 4080 | 3952 |
| Green | 1536 | 752  | 848 | 1040 | 1904 | 1984 | 2032 | 2064 | 2176 |
| Blue  | 1408 | 1264 | 1472 | 1664 | 2751 | 2800 | 2800 | 2832 | 3024 |
|       | 0  | 18 | 30 | 60 | 120 | 180 | 240 | 300 | 3600 |
| Red   | 4080 | 3536 | 3680 | 4080 | 4080 | 4080 | 4080 | 4080 | 4080 |
| Green | 1520 | 896  | 992 | 1632 | 1680 | 1712 | 1712 | 1744 | 1792 |
| Blue  | 1152 | 1408 | 1568 | 2240 | 2320 | 2352 | 2368 | 2432 | 2496 |
Figure S6: Colorimetric time response profiles over 5 minutes (300 seconds) by percentage change in each of the R, G and B colour components for GB at varied concentrations.

VO, 254 nm

Figure S7: Normalised photographs of the dyad loaded paper assay with one drop of VO at varied concentrations over time.
Table S3: RGB triplet data generated from the Spotfinder software for the normalised photographs from the VO experiments in Figure S7.

|       | 0   | 17  | 30  | 60  | 120 | 180 | 240 | 300 | 3600 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Neat  |     |     |     |     |     |     |     |     |      |
| Red   | 4080| 352 | 336 | 304 | 240 | 208 | 192 | 176 | 80   |
| Green | 1472| 144 | 288 | 352 | 352 | 352 | 336 | 336 | 384  |
| Blue  | 1232| 656 | 944 | 1072| 1104| 1056| 1008| 1008| 1072 |
| 0.1 M |     |     |     |     |     |     |     |     |      |
| Red   | 4080| 10  | 30  | 60  | 120 | 180 | 240 | 300 | 3600 |
| Green | 1344| 224 | 192 | 208 | 528 | 576 | 608 | 608 | 752  |
| Blue  | 1168| 464 | 416 | 432 | 1152| 1216| 1280| 1280| 1472 |
| 0.05 M|     |     |     |     |     |     |     |     |      |
| Red   | 4080| 720 | 592 | 624 | 704 | 720 | 688 | 624 | 1280 |
| Green | 1264| 256 | 224 | 176 | 688 | 736 | 752 | 736 | 1296 |
| Blue  | 1136| 512 | 480 | 368 | 1408| 1488| 1504| 1504| 2256 |
| 0.01 M|     |     |     |     |     |     |     |     |      |
| Red   | 4080| 1456| 1504| 1824| 2128| 2304| 2464| 2592| 3648 |
| Green | 1168| 272 | 256 | 208 | 1216| 1232| 1200| 1184| 1200 |
| Blue  | 992 | 544 | 512 | 400 | 2128| 2096| 2016| 1936| 1744 |
| 0.001 M|    |    |     |     |     |     |     |     |      |
| Red   | 4080| 1552| 1920| 4048| 4080| 4080| 4080| 4080| 4064 |
| Green | 1344| 304 | 320 | 864 | 944 | 960 | 944 | 944 | 928  |
| Blue  | 1120| 624 | 592 | 1216| 1264| 1296| 1280| 1280| 1264 |

Figure S8: Colorimetric time response profiles over 5 minutes (300 seconds) by percentage change in each of the R, G and B colour components for VO at varied concentrations. Outlier removed from 0.01 M R:B ratio profile at 60 secs.
Figure S9: Normalised photographs of the dyad loaded paper assay with one drop of DMMP at varied concentrations over time.

Table S4: RGB triplet data generated from the Spotfinder software for the normalised photographs from the DMMP experiments in Figure S9.
Figure S10: Colorimetric time response profiles over 5 minutes (300 seconds) by percentage change in each of the R, G and B colour components for DMMP at varied concentrations.

TEP, 254 nm

Figure S11: Normalised photographs of the dyad loaded paper assay with one drop of TEP at varied concentrations over time. The images immediately after addition of the neat TEP and 4 minutes (240 sec) at 0.001 M were corrupted and have not been displayed.
Table S5: RGB triplet data generated from the Spotfinder software for the normalised photographs from the TEP experiments in Figure S11.

|        | 0     | 30    | 60    | 120   | 180   | 240   | 300   | 3600  |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| **Neat** |       |       |       |       |       |       |       |       |
| Red    | 4080  | 1072  | 928   | 880   | 832   | 800   | 768   | 256   |
| Green  | 1328  | 640   | 640   | 704   | 704   | 720   | 736   | 656   |
| Blue   | 1696  | 1296  | 1312  | 1424  | 1440  | 1504  | 1520  | 1392  |
| **0.1 M** |       |       |       |       |       |       |       |       |
| Red    | 4080  | 1856  | 1904  | 2400  | 3120  | 3040  | 2864  | 2800  | 3424  |
| Green  | 1248  | 432   | 416   | 800   | 1040  | 1184  | 1232  | 1328  | 1888  |
| Blue   | 1152  | 832   | 784   | 768   | 1808  | 2064  | 2176  | 2320  | 2912  |
| **0.05 M** |       |       |       |       |       |       |       |       |
| Red    | 4080  | 2160  | 2224  | 2784  | 2752  | 2800  | 2816  | 2816  | 2880  |
| Green  | 1584  | 1344  | 1424  | 1488  | 3760  | 3808  | 3824  | 3824  | 3760  |
| Blue   | 1584  | 1344  | 1424  | 1488  | 3760  | 3808  | 3824  | 3824  | 3760  |
| **0.01 M** |       |       |       |       |       |       |       |       |
| Red    | 4080  | 2352  | 2208  | 2800  | 3312  | 3264  | 3216  | 3248  | 3040  |
| Green  | 1360  | 784   | 880   | 896   | 2336  | 2368  | 2400  | 2448  | 2544  |
| Blue   | 1616  | 1472  | 1632  | 1632  | 3520  | 3552  | 3568  | 3632  | 3712  |
| **0.001 M** |       |       |       |       |       |       |       |       |
| Red    | 4080  | 1632  | 1744  | 2464  | 4064  | 4064  |       |       |       |
| Green  | 1328  | 576   | 560   | 448   | 1168  | 1168  |       |       |       |
| Blue   | 1376  | 1120  | 1072  | 832   | 1760  | 1760  |       |       |       |

Figure S12: Colorimetric time response profiles over 5 minutes (300 seconds) by percentage change in each of the R, G and B colour components for TEP at varied concentrations.
**TEphosphite, 254 nm**

![Figure S13](image)

**Figure S13:** Normalised photographs of the dyad loaded paper assay with one drop of TEPhosphite at varied concentrations over time.

**Table S6:** RGB triplet data generated from the Spotfinder software for the normalised photographs from the TEPhosphite experiments in Figure S13.

|       | Neat  | 0.1 M | 0.05 M | 0.01 M | 0.001 M |
|-------|-------|-------|--------|--------|---------|
|       | 0     | 11    | 30     | 60     | 120     | 180     | 240     | 300     | 3600    |
| **Red** | 4080  | 2416  | 2288   | 2240   | 2112    | 2000    | 1920    | 1728    | 4032    |
| **Green** | 1440  | 1616  | 1760   | 1856   | 1872    | 1936    | 1920    | 1792    | 1408    |
| **Blue** | 1152  | 2704  | 2864   | 2992   | 3024    | 3072    | 3056    | 2880    | 1904    |
| **Red** | 4080  | 2704  | 2624   | 3232   | 4080    | 4080    | 4080    | 4080    | 4080    |
| **Green** | 1552  | 720   | 752    | 816    | 1616    | 696     | 1760    | 1776    | 1680    |
| **Blue** | 1424  | 1280  | 1376   | 1392   | 2432    | 2512    | 2576    | 2608    | 2528    |
| **Red** | 4080  | 2400  | 2592   | 3424   | 4080    | 4080    | 4080    | 4080    | 4080    |
| **Green** | 1536  | 592   | 624    | 688    | 1408    | 1360    | 1376    | 1408    | 1296    |
| **Blue** | 1280  | 1120  | 1168   | 1120   | 2048    | 1968    | 1984    | 2032    | 1904    |
| **Red** | 4080  | 2944  | 3056   | 3696   | 4080    | 4080    | 4080    | 4080    | 4080    |
| **Green** | 1344  | 880   | 912    | 976    | 1488    | 1520    | 1520    | 1552    | 1520    |
| **Blue** | 1200  | 1504  | 1552   | 1520   | 2064    | 2081    | 2096    | 2112    | 2224    |
Figure S14: Colorimetric time response profiles over 5 minutes (300 seconds) by percentage change in each of the R, G and B colour components for TEPhosphite at varied concentrations.

Figure S15: Normalised photographs of the dyad loaded paper assay with one drop of TEA at varied concentrations over time.
Table S7: RGB triplet data generated from the Spotfinder software for the normalised photographs from the TEA experiments in Figure S15.

|       | 0    | 9    | 30   | 60   | 120  | 180  | 240  | 300  | 3600 |
|-------|------|------|------|------|------|------|------|------|------|
| **Neat** |      |      |      |      |      |      |      |      |      |
| Red   | 4080 | 3032 | 1744 | 2288 | 3184 | 3536 | 3728 | 3776 | 4000 |
| Green | 1456 | 592  | 688  | 576  | 704  | 752  | 816  | 832  | 816  |
| Blue  | 1072 | 912  | 1056 | 880  | 992  | 1024 | 1072 | 1072 | 944  |
| **0.1 M** |      |      |      |      |      |      |      |      |      |
| Red   | 4080 | 800  | 528  | 2128 | 4080 | 4080 | 4080 | 4080 | 3984 |
| Green | 1520 | 432  | 416  | 368  | 944  | 992  | 992  | 1024 | 1008 |
| Blue  | 1200 | 880  | 912  | 672  | 1264 | 1312 | 1344 | 1392 | 1488 |
| **0.05 M** |      |      |      |      |      |      |      |      |      |
| Red   | 4080 | 576  | 512  | 1904 | 4016 | 4035 | 4048 | 4048 | 3968 |
| Green | 1552 | 384  | 368  | 240  | 880  | 880  | 912  | 912  | 912  |
| Blue  | 1216 | 816  | 752  | 432  | 1056 | 1088 | 1104 | 1152 | 1248 |
| **0.01 M** |      |      |      |      |      |      |      |      |      |
| Red   | 4080 | 1776 | 1552 | 1888 | 4080 | 4080 | 4080 | 4080 | 4080 |
| Green | 1424 | 544  | 576  | 624  | 1264 | 1296 | 1344 | 1296 | 1456 |
| Blue  | 1248 | 1040 | 1136 | 1200 | 1792 | 1840 | 1920 | 1888 | 2144 |
| **0.001 M** |      |      |      |      |      |      |      |      |      |
| Red   | 4080 | 2352 | 2448 | 3200 | 4080 | 4080 | 4080 | 4080 | 4000 |
| Green | 1392 | 592  | 640  | 720  | 1296 | 1344 | 1360 | 1392 | 1440 |
| Blue  | 1200 | 1088 | 1200 | 1232 | 1952 | 1984 | 2000 | 2048 | 2160 |

**Figure S16:** Colorimetric time response profiles over 5 minutes (300 seconds) by percentage change in each of the R, G and B colour components for TEA at varied concentrations.
INTERFERENTS, 254 nm

|                | Blank | Immediate | 30 sec | 60 sec | 120 sec | 180 sec | 240 sec | 300 sec | 3600 sec |
|----------------|-------|-----------|--------|--------|---------|---------|---------|---------|----------|
| Acetone        |       |           |        |        |         |         |         |         |          |
| DCM            |       |           |        |        |         |         |         |         |          |
| Diethyl Ether  |       |           |        |        |         |         |         |         |          |
| DMF            |       |           |        |        |         |         |         |         |          |
| Ethanol        |       |           |        |        |         |         |         |         |          |
| Ethyl Acetate  |       |           |        |        |         |         |         |         |          |
| Hexane         |       |           |        |        |         |         |         |         |          |
| Isopropanol    |       |           |        |        |         |         |         |         |          |
| Toluene        |       |           |        |        |         |         |         |         |          |
| Water          |       |           |        |        |         |         |         |         |          |
| Acetonitrile   |       |           |        |        |         |         |         |         |          |

**Figure S17:** Normalised photographs of the dyad loaded paper assay with one drop of neat various solvent / interferent over time. The images of acetone at 1 minute (60 seconds) and toluene at 5 minutes (300 seconds) failed or were corrupted and have not been displayed.
Table S8: RGB triplet data generated from the Spotfinder software for the normalised photographs from the interferent experiments in Figure S17.

|        | 0    | 5    | 30   | 60   | 120  | 180  | 240  | 300  | 3600 | 0    |
|--------|------|------|------|------|------|------|------|------|------|------|
| Acetone| 4080 | 2432 | 3968 | 3968 | 3968 | 3968 | 3968 | 3968 | 3968 | 3872 |
|        | 1376 | 304  | 864  | 864  | 864  | 864  | 864  | 864  | 864  | 768  |
|        | 1216 | 576  | 1232 | 1216 | 1184 | 1200 | 1232 | 1104 | 1216 | 1126 |
| DCM    | 0    | 9    | 30   | 60   | 120  | 180  | 240  | 300  | 3600 | 0    |
| Red    | 4080 | 3920 | 3968 | 3984 | 3984 | 4000 | 3984 | 4016 |
| Green  | 1168 | 880  | 848  | 848  | 864  | 880  | 880  | 864  | 896  |
| Blue   | 1040 | 1360 | 1088 | 1104 | 1120 | 1136 | 1152 | 1120 | 1168 |
| Diethyl Ether | 0    | 11   | 30   | 60   | 120  | 180  | 240  | 300  | 3600 | 0    |
| Red    | 4080 | 3088 | 3936 | 3952 | 3936 | 3952 | 3952 | 3952 | 4000 |
| Green  | 1216 | 864  | 800  | 816  | 800  | 816  | 832  | 832  | 880  |
| Blue   | 1072 | 1520 | 1104 | 1104 | 1072 | 1104 | 1104 | 1104 | 1168 |
| DMF    | 0    | 20   | 30   | 60   | 120  | 180  | 240  | 300  | 3600 | 0    |
| Red    | 4080 | 736  | 688  | 704  | 896  | 1456 | 3824 | 3856 | 3728 |
| Green  | 1296 | 192  | 192  | 240  | 368  | 512  | 352  | 704  | 2944 |
| Blue   | 1200 | 400  | 432  | 528  | 848  | 1152 | 940  | 1160 | 1396 |
| Ethanol| 0    | 12   | 30   | 60   | 120  | 180  | 240  | 300  | 3600 | 0    |
| Red    | 4080 | 736  | 688  | 704  | 896  | 1456 | 3824 | 3856 | 3728 |
| Green  | 1456 | 816  | 736  | 688  | 608  | 400  | 1376 | 1424 | 1440 |
| Blue   | 1248 | 1712 | 1584 | 1488 | 1312 | 784  | 2176 | 2224 | 2272 |
| Ethyl Acetate | 0    | 10   | 30   | 60   | 120  | 180  | 240  | 300  | 3600 | 0    |
| Red    | 4080 | 2752 | 2928 | 3984 | 3904 | 3952 | 3968 | 3968 | 4032 |
| Green  | 1328 | 592  | 640  | 848  | 768  | 832  | 864  | 944  |
| Blue   | 1152 | 1104 | 1136 | 1168 | 1024 | 1104 | 1120 | 1136 | 1200 |
| Hexane | 0    | 10   | 30   | 60   | 120  | 180  | 240  | 300  | 3600 | 0    |
| Red    | 4080 | 4080 | 4080 | 4080 | 4080 | 4080 | 4080 | 4080 | 4080 |
| Green  | 1072 | 1088 | 1200 | 1200 | 1168 | 1152 | 1152 | 1136 | 1104 |
| Blue   | 1024 | 1120 | 1120 | 1120 | 1088 | 1088 | 1088 | 1088 | 1040 |
| Isopropanol | 0    | 10   | 30   | 60   | 120  | 180  | 240  | 300  | 3600 | 0    |
| Red    | 4080 | 928  | 880  | 912  | 1344 | 3488 | 3520 | 3360 | 3728 |
| Green  | 1152 | 640  | 640  | 656  | 592  | 576  | 592  | 528  | 672  |
| Blue   | 1008 | 1360 | 1392 | 1392 | 1200 | 880  | 864  | 816  | 960  |
| Toluene| 0    | 18   | 30   | 60   | 120  | 180  | 240  | 300  | 3600 | 0    |
| Red    | 4080 | 2224 | 2032 | 2160 | 1616 | 1392 | 3504 | 3664 |
| Green  | 1264 | 160  | 144  | 176  | 176  | 224  | 528  | 576  |
| Blue   | 1152 | 272  | 256  | 304  | 336  | 400  | 752  | 800  | 900  |
| Water  | 0    | 18   | 30   | 60   | 120  | 180  | 240  | 300  | 3600 | 0    |
| Red    | 4080 | 3584 | 3376 | 3392 | 3392 | 3472 | 3408 | 3504 | 4304 |
| Green  | 1200 | 640  | 608  | 592  | 592  | 624  | 608  | 640  | 1552 |
| Blue   | 1216 | 880  | 912  | 880  | 912  | 896  | 944  | 2304 |
| Acetonitrile | 0    | 18   | 30   | 60   | 120  | 180  | 240  | 300  | 3600 | 0    |
| Red    | 4080 | 2192 | 2448 | 3152 | 4080 | 4080 | 4080 | 4080 | 4080 |
| Green  | 1376 | 416  | 384  | 384  | 1168 | 1152 | 1136 | 1120 | 1088 |
| Blue   | 1200 | 752  | 672  | 560  | 1344 | 1328 | 1328 | 1296 | 1280 |
Figure S18a: Colorimetric time response profiles over 5 minutes (300 seconds) by percentage change in each of the R, G and B colour components for the interferents at varied concentrations.
Figure S18b: Colorimetric time response profiles over 5 minutes (300 seconds) by percentage change in each of the R, G and B colour components for the interferents at varied concentrations.

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