**OC 523: HW1**

This homework is looking at the molecular diffusion of nutrients towards the cell surface of two small cells. One cell has a diameter of 1 micrometer and the larger has a diameter of 8 micrometers. The minimum cell quota for N for the larger cell is 5.1E-12 mol\*N per cell which is different than the smaller one which is 1E-14 mol\*N per cell. One of the take always would seem to be that smaller cells require less NH for their surface area.

**Table 1:** All Diffusive Cellular Transport Variables

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **1 Micrometer Cell** | **8 Micrometer Cell** | **Units** |
| Cell Diameter Size | 1 | 8 | µm |
| Cell Diameter Size | 0.0001 | 0.0008 | cm |
| Cell Radius | 5.00E-05 | 4.00E-04 | cm |
| Cell Surface Area | 3.14E-08 | 3.14E-08 | cm^2 |
| 4π | 12.56 | 12.56 | cm^2 |
| Distance of Spheres | 2.00E-05 | 2.00E-05 | cm^2 |
| Molecular Diffusion Coefficient | 6.00E-05 | 6.00E-05 | cm^2/s |
| Growth Rate | 2.32E-05 | 2.32E-05 | 1/s |
| Minimum Cell Quota | 1.00E-14 | 5.10E-12 | N/cell |
| Minimum Uptake Rate\* | 2.32E-19 | 1.18E-16 | mol\*N/cell\*s |
| dX | 6.00E-05 | 6.00E-05 | mol\*N/cm^4 |

To solve for this problem the calculations were done in Excel which allowed for solving and analyzing multiple cell diameters. Table 1 shows the variables used to calculate for our two cells.

**Figure 1:** Cell with 1 µm Diameter

As can be seen from the Appendix 1.1 and Appendix 1.2 the required diffusive flux of NH4+ per unit surface area gets smaller as the spheres get smaller from the surface of the cell. We can see from Figure 1 that when the far-field NH4+ is about 7.5nM it should be able support a growth rate of about 2.0 d-1. We can see from Figure 2 that this value for an 8 micrometer cell is around 20 nM.

**Figure 2:** Cell with 8 µm Diameter

**Appendix:**

**Appendix 1.1:** All Values for Cell with 1 µm Diameter

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Total Spheres Away** | **Distance (nM)** | **Cell Surface Area (cm^2)** | **Minimum Flux Rate of NH4+ (mol\*N/cm^2s)** | **d[NH4]/dX gradient (mol N)** | **NH4 (nM)** |
| 1 | 0.00 | 3.14E-08 | 7.39E-12 | 1.23E-07 | 0.00 |
| 2 | 0.20 | 6.15E-08 | 3.77E-12 | 6.28E-08 | 2.46 |
| 3 | 0.40 | 1.02E-07 | 2.28E-12 | 3.80E-08 | 3.72 |
| 4 | 0.60 | 1.52E-07 | 1.53E-12 | 2.54E-08 | 4.48 |
| 5 | 0.80 | 2.12E-07 | 1.09E-12 | 1.82E-08 | 4.99 |
| 6 | 1.00 | 2.83E-07 | 8.21E-13 | 1.37E-08 | 5.35 |
| 7 | 1.20 | 3.63E-07 | 6.39E-13 | 1.07E-08 | 5.63 |
| 8 | 1.40 | 4.53E-07 | 5.12E-13 | 8.53E-09 | 5.84 |
| 9 | 1.60 | 5.54E-07 | 4.19E-13 | 6.98E-09 | 6.01 |
| 10 | 1.80 | 6.64E-07 | 3.49E-13 | 5.82E-09 | 6.15 |
| 11 | 2.00 | 7.85E-07 | 2.96E-13 | 4.93E-09 | 6.27 |
| 12 | 2.20 | 9.16E-07 | 2.53E-13 | 4.22E-09 | 6.36 |
| 13 | 2.40 | 1.06E-06 | 2.20E-13 | 3.66E-09 | 6.45 |
| 14 | 2.60 | 1.21E-06 | 1.92E-13 | 3.20E-09 | 6.52 |
| 15 | 2.80 | 1.37E-06 | 1.70E-13 | 2.83E-09 | 6.59 |
| 16 | 3.00 | 1.54E-06 | 1.51E-13 | 2.51E-09 | 6.64 |
| 17 | 3.20 | 1.72E-06 | 1.35E-13 | 2.25E-09 | 6.69 |
| 18 | 3.40 | 1.91E-06 | 1.21E-13 | 2.02E-09 | 6.74 |
| 19 | 3.60 | 2.11E-06 | 1.10E-13 | 1.83E-09 | 6.78 |
| 20 | 3.80 | 2.32E-06 | 9.99E-14 | 1.66E-09 | 6.82 |
| 21 | 4.00 | 2.54E-06 | 9.12E-14 | 1.52E-09 | 6.85 |
| 22 | 4.20 | 2.77E-06 | 8.36E-14 | 1.39E-09 | 6.88 |
| 23 | 4.40 | 3.02E-06 | 7.69E-14 | 1.28E-09 | 6.91 |
| 24 | 4.60 | 3.27E-06 | 7.10E-14 | 1.18E-09 | 6.93 |
| 25 | 4.80 | 3.53E-06 | 6.58E-14 | 1.10E-09 | 6.96 |
| 26 | 5.00 | 3.80E-06 | 6.11E-14 | 1.02E-09 | 6.98 |
| 27 | 5.20 | 4.08E-06 | 5.69E-14 | 9.48E-10 | 7.00 |
| 28 | 5.40 | 4.37E-06 | 5.31E-14 | 8.84E-10 | 7.02 |
| 29 | 5.60 | 4.67E-06 | 4.96E-14 | 8.27E-10 | 7.03 |
| 30 | 5.80 | 4.99E-06 | 4.65E-14 | 7.76E-10 | 7.05 |
| 31 | 6.00 | 5.31E-06 | 4.37E-14 | 7.29E-10 | 7.07 |
| 32 | 6.20 | 5.64E-06 | 4.11E-14 | 6.86E-10 | 7.08 |
| 33 | 6.40 | 5.98E-06 | 3.88E-14 | 6.47E-10 | 7.10 |
| 34 | 6.60 | 6.33E-06 | 3.66E-14 | 6.11E-10 | 7.11 |
| 35 | 6.80 | 6.69E-06 | 3.47E-14 | 5.78E-10 | 7.12 |
| 36 | 7.00 | 7.07E-06 | 3.28E-14 | 5.47E-10 | 7.13 |
| 37 | 7.20 | 7.45E-06 | 3.12E-14 | 5.19E-10 | 7.14 |
| 38 | 7.40 | 7.84E-06 | 2.96E-14 | 4.93E-10 | 7.15 |
| 39 | 7.60 | 8.24E-06 | 2.82E-14 | 4.69E-10 | 7.16 |
| 40 | 7.80 | 8.65E-06 | 2.68E-14 | 4.47E-10 | 7.17 |
| 41 | 8.00 | 9.07E-06 | 2.56E-14 | 4.26E-10 | 7.18 |
| 42 | 8.20 | 9.51E-06 | 2.44E-14 | 4.07E-10 | 7.19 |
| 43 | 8.40 | 9.95E-06 | 2.33E-14 | 3.89E-10 | 7.20 |
| 44 | 8.60 | 1.04E-05 | 2.23E-14 | 3.72E-10 | 7.21 |
| 45 | 8.80 | 1.09E-05 | 2.14E-14 | 3.56E-10 | 7.21 |
| 46 | 9.00 | 1.13E-05 | 2.05E-14 | 3.41E-10 | 7.22 |
| 47 | 9.20 | 1.18E-05 | 1.96E-14 | 3.27E-10 | 7.23 |
| 48 | 9.40 | 1.23E-05 | 1.88E-14 | 3.14E-10 | 7.23 |
| 49 | 9.60 | 1.28E-05 | 1.81E-14 | 3.02E-10 | 7.24 |
| 50 | 9.80 | 1.33E-05 | 1.74E-14 | 2.90E-10 | 7.25 |
| 51 | 10.00 | 1.38E-05 | 1.68E-14 | 2.79E-10 | 7.25 |
| 52 | 10.20 | 1.44E-05 | 1.61E-14 | 2.69E-10 | 7.26 |
| 53 | 10.40 | 1.49E-05 | 1.55E-14 | 2.59E-10 | 7.26 |
| 54 | 10.60 | 1.55E-05 | 1.50E-14 | 2.50E-10 | 7.27 |
| 55 | 10.80 | 1.60E-05 | 1.45E-14 | 2.41E-10 | 7.27 |
| 56 | 11.00 | 1.66E-05 | 1.40E-14 | 2.33E-10 | 7.28 |
| 57 | 11.20 | 1.72E-05 | 1.35E-14 | 2.25E-10 | 7.28 |
| 58 | 11.40 | 1.78E-05 | 1.30E-14 | 2.17E-10 | 7.29 |
| 59 | 11.60 | 1.84E-05 | 1.26E-14 | 2.10E-10 | 7.29 |
| 60 | 11.80 | 1.90E-05 | 1.22E-14 | 2.03E-10 | 7.30 |
| 61 | 12.00 | 1.96E-05 | 1.18E-14 | 1.97E-10 | 7.30 |
| 62 | 12.20 | 2.03E-05 | 1.15E-14 | 1.91E-10 | 7.30 |
| 63 | 12.40 | 2.09E-05 | 1.11E-14 | 1.85E-10 | 7.31 |
| 64 | 12.60 | 2.16E-05 | 1.08E-14 | 1.79E-10 | 7.31 |
| 65 | 12.80 | 2.22E-05 | 1.04E-14 | 1.74E-10 | 7.31 |
| 66 | 13.00 | 2.29E-05 | 1.01E-14 | 1.69E-10 | 7.32 |
| 67 | 13.20 | 2.36E-05 | 9.84E-15 | 1.64E-10 | 7.32 |
| 68 | 13.40 | 2.43E-05 | 9.56E-15 | 1.59E-10 | 7.32 |
| 69 | 13.60 | 2.50E-05 | 9.29E-15 | 1.55E-10 | 7.33 |
| 70 | 13.80 | 2.57E-05 | 9.03E-15 | 1.51E-10 | 7.33 |
| 71 | 14.00 | 2.64E-05 | 8.79E-15 | 1.46E-10 | 7.33 |
| 72 | 14.20 | 2.71E-05 | 8.55E-15 | 1.42E-10 | 7.34 |
| 73 | 14.40 | 2.79E-05 | 8.32E-15 | 1.39E-10 | 7.34 |
| 74 | 14.60 | 2.86E-05 | 8.10E-15 | 1.35E-10 | 7.34 |
| 75 | 14.80 | 2.94E-05 | 7.89E-15 | 1.32E-10 | 7.35 |
| 76 | 15.00 | 3.02E-05 | 7.69E-15 | 1.28E-10 | 7.35 |

**Appendix 1.2:** All Values for Cell with 8 µm Diameter

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Total Spheres Away** | **Distance (nM)** | **Cell Surface Area (cm^2)** | **Minimum Flux Rate of NH4+ (mol\*N/cm^2s)** | **d[NH4]/dX gradient (mol N)** | **NH4 (nM)** |
| 1 | 0.00 | 2.01E-06 | 5.89E-11 | 9.81E-07 | 0 |
| 2 | 0.20 | 2.22E-06 | 5.34E-11 | 8.90E-07 | 20 |
| 3 | 0.40 | 2.43E-06 | 4.87E-11 | 8.11E-07 | 37 |
| 4 | 0.60 | 2.66E-06 | 4.45E-11 | 7.42E-07 | 54 |
| 5 | 0.80 | 2.89E-06 | 4.09E-11 | 6.81E-07 | 68 |
| 6 | 1.00 | 3.14E-06 | 3.77E-11 | 6.28E-07 | 82 |
| 7 | 1.20 | 3.40E-06 | 3.48E-11 | 5.81E-07 | 95 |
| 8 | 1.40 | 3.66E-06 | 3.23E-11 | 5.38E-07 | 106 |
| 9 | 1.60 | 3.94E-06 | 3.00E-11 | 5.01E-07 | 117 |
| 10 | 1.80 | 4.23E-06 | 2.80E-11 | 4.67E-07 | 127 |
| 11 | 2.00 | 4.52E-06 | 2.62E-11 | 4.36E-07 | 136 |
| 12 | 2.20 | 4.83E-06 | 2.45E-11 | 4.08E-07 | 145 |
| 13 | 2.40 | 5.14E-06 | 2.30E-11 | 3.83E-07 | 153 |
| 14 | 2.60 | 5.47E-06 | 2.16E-11 | 3.60E-07 | 161 |
| 15 | 2.80 | 5.81E-06 | 2.04E-11 | 3.40E-07 | 168 |
| 16 | 3.00 | 6.15E-06 | 1.92E-11 | 3.20E-07 | 175 |
| 17 | 3.20 | 6.51E-06 | 1.82E-11 | 3.03E-07 | 181 |
| 18 | 3.40 | 6.88E-06 | 1.72E-11 | 2.87E-07 | 187 |
| 19 | 3.60 | 7.25E-06 | 1.63E-11 | 2.72E-07 | 193 |
| 20 | 3.80 | 7.64E-06 | 1.55E-11 | 2.58E-07 | 199 |
| 21 | 4.00 | 8.04E-06 | 1.47E-11 | 2.45E-07 | 204 |
| 22 | 4.20 | 8.45E-06 | 1.40E-11 | 2.34E-07 | 209 |
| 23 | 4.40 | 8.86E-06 | 1.34E-11 | 2.23E-07 | 213 |
| 24 | 4.60 | 9.29E-06 | 1.27E-11 | 2.12E-07 | 218 |
| 25 | 4.80 | 9.73E-06 | 1.22E-11 | 2.03E-07 | 222 |
| 26 | 5.00 | 1.02E-05 | 1.16E-11 | 1.94E-07 | 226 |
| 27 | 5.20 | 1.06E-05 | 1.11E-11 | 1.85E-07 | 230 |
| 28 | 5.40 | 1.11E-05 | 1.07E-11 | 1.78E-07 | 234 |
| 29 | 5.60 | 1.16E-05 | 1.02E-11 | 1.70E-07 | 237 |
| 30 | 5.80 | 1.21E-05 | 9.81E-12 | 1.63E-07 | 241 |
| 31 | 6.00 | 1.26E-05 | 9.42E-12 | 1.57E-07 | 244 |
| 32 | 6.20 | 1.31E-05 | 9.05E-12 | 1.51E-07 | 247 |
| 33 | 6.40 | 1.36E-05 | 8.71E-12 | 1.45E-07 | 250 |
| 34 | 6.60 | 1.41E-05 | 8.38E-12 | 1.40E-07 | 253 |
| 35 | 6.80 | 1.46E-05 | 8.08E-12 | 1.35E-07 | 256 |
| 36 | 7.00 | 1.52E-05 | 7.79E-12 | 1.30E-07 | 258 |
| 37 | 7.20 | 1.58E-05 | 7.51E-12 | 1.25E-07 | 261 |
| 38 | 7.40 | 1.63E-05 | 7.25E-12 | 1.21E-07 | 264 |
| 39 | 7.60 | 1.69E-05 | 7.00E-12 | 1.17E-07 | 266 |
| 40 | 7.80 | 1.75E-05 | 6.77E-12 | 1.13E-07 | 268 |
| 41 | 8.00 | 1.81E-05 | 6.54E-12 | 1.09E-07 | 271 |
| 42 | 8.20 | 1.87E-05 | 6.33E-12 | 1.05E-07 | 273 |
| 43 | 8.40 | 1.93E-05 | 6.13E-12 | 1.02E-07 | 275 |
| 44 | 8.60 | 1.99E-05 | 5.93E-12 | 9.89E-08 | 277 |
| 45 | 8.80 | 2.06E-05 | 5.75E-12 | 9.58E-08 | 279 |
| 46 | 9.00 | 2.12E-05 | 5.57E-12 | 9.29E-08 | 281 |
| 47 | 9.20 | 2.19E-05 | 5.41E-12 | 9.01E-08 | 283 |
| 48 | 9.40 | 2.26E-05 | 5.25E-12 | 8.74E-08 | 284 |
| 49 | 9.60 | 2.32E-05 | 5.09E-12 | 8.49E-08 | 286 |
| 50 | 9.80 | 2.39E-05 | 4.95E-12 | 8.24E-08 | 288 |
| 51 | 10.00 | 2.46E-05 | 4.81E-12 | 8.01E-08 | 290 |
| 52 | 10.20 | 2.53E-05 | 4.67E-12 | 7.79E-08 | 291 |
| 53 | 10.40 | 2.60E-05 | 4.54E-12 | 7.57E-08 | 293 |
| 54 | 10.60 | 2.68E-05 | 4.42E-12 | 7.37E-08 | 294 |
| 55 | 10.80 | 2.75E-05 | 4.30E-12 | 7.17E-08 | 296 |
| 56 | 11.00 | 2.83E-05 | 4.19E-12 | 6.98E-08 | 297 |
| 57 | 11.20 | 2.90E-05 | 4.08E-12 | 6.80E-08 | 299 |
| 58 | 11.40 | 2.98E-05 | 3.97E-12 | 6.62E-08 | 300 |
| 59 | 11.60 | 3.06E-05 | 3.87E-12 | 6.45E-08 | 301 |
| 60 | 11.80 | 3.14E-05 | 3.77E-12 | 6.29E-08 | 302 |
| 61 | 12.00 | 3.22E-05 | 3.68E-12 | 6.13E-08 | 304 |
| 62 | 12.20 | 3.30E-05 | 3.59E-12 | 5.98E-08 | 305 |
| 63 | 12.40 | 3.38E-05 | 3.50E-12 | 5.84E-08 | 306 |
| 64 | 12.60 | 3.46E-05 | 3.42E-12 | 5.70E-08 | 307 |
| 65 | 12.80 | 3.54E-05 | 3.34E-12 | 5.56E-08 | 308 |
| 66 | 13.00 | 3.63E-05 | 3.26E-12 | 5.43E-08 | 310 |
| 67 | 13.20 | 3.72E-05 | 3.18E-12 | 5.31E-08 | 311 |
| 68 | 13.40 | 3.80E-05 | 3.11E-12 | 5.19E-08 | 312 |
| 69 | 13.60 | 3.89E-05 | 3.04E-12 | 5.07E-08 | 313 |
| 70 | 13.80 | 3.98E-05 | 2.97E-12 | 4.96E-08 | 314 |
| 71 | 14.00 | 4.07E-05 | 2.91E-12 | 4.85E-08 | 315 |
| 72 | 14.20 | 4.16E-05 | 2.84E-12 | 4.74E-08 | 316 |
| 73 | 14.40 | 4.25E-05 | 2.78E-12 | 4.64E-08 | 317 |
| 74 | 14.60 | 4.35E-05 | 2.72E-12 | 4.54E-08 | 318 |
| 75 | 14.80 | 4.44E-05 | 2.67E-12 | 4.44E-08 | 319 |
| 76 | 15.00 | 4.53E-05 | 2.61E-12 | 4.35E-08 | 319 |
| 77 | 15.20 | 4.63E-05 | 2.56E-12 | 4.26E-08 | 320 |
| 78 | 15.40 | 4.73E-05 | 2.50E-12 | 4.17E-08 | 321 |
| 79 | 15.60 | 4.83E-05 | 2.45E-12 | 4.09E-08 | 322 |
| 80 | 15.80 | 4.92E-05 | 2.40E-12 | 4.00E-08 | 323 |
| 81 | 16.00 | 5.02E-05 | 2.36E-12 | 3.93E-08 | 324 |
| 82 | 16.20 | 5.12E-05 | 2.31E-12 | 3.85E-08 | 324 |
| 83 | 16.40 | 5.23E-05 | 2.26E-12 | 3.77E-08 | 325 |
| 84 | 16.60 | 5.33E-05 | 2.22E-12 | 3.70E-08 | 326 |
| 85 | 16.80 | 5.43E-05 | 2.18E-12 | 3.63E-08 | 327 |
| 86 | 17.00 | 5.54E-05 | 2.14E-12 | 3.56E-08 | 327 |
| 87 | 17.20 | 5.64E-05 | 2.10E-12 | 3.49E-08 | 328 |
| 88 | 17.40 | 5.75E-05 | 2.06E-12 | 3.43E-08 | 329 |
| 89 | 17.60 | 5.86E-05 | 2.02E-12 | 3.37E-08 | 329 |
| 90 | 17.80 | 5.97E-05 | 1.98E-12 | 3.30E-08 | 330 |
| 91 | 18.00 | 6.08E-05 | 1.95E-12 | 3.24E-08 | 331 |
| 92 | 18.20 | 6.19E-05 | 1.91E-12 | 3.19E-08 | 331 |
| 93 | 18.40 | 6.30E-05 | 1.88E-12 | 3.13E-08 | 332 |
| 94 | 18.60 | 6.42E-05 | 1.84E-12 | 3.07E-08 | 333 |
| 95 | 18.80 | 6.53E-05 | 1.81E-12 | 3.02E-08 | 333 |
| 96 | 19.00 | 6.64E-05 | 1.78E-12 | 2.97E-08 | 334 |
| 97 | 19.20 | 6.76E-05 | 1.75E-12 | 2.92E-08 | 335 |
| 98 | 19.40 | 6.88E-05 | 1.72E-12 | 2.87E-08 | 335 |
| 99 | 19.60 | 7.00E-05 | 1.69E-12 | 2.82E-08 | 336 |
| 100 | 19.80 | 7.11E-05 | 1.66E-12 | 2.77E-08 | 336 |
| 101 | 20.00 | 7.23E-05 | 1.64E-12 | 2.73E-08 | 337 |
| 102 | 20.20 | 7.36E-05 | 1.61E-12 | 2.68E-08 | 337 |
| 103 | 20.40 | 7.48E-05 | 1.58E-12 | 2.64E-08 | 338 |
| 104 | 20.60 | 7.60E-05 | 1.56E-12 | 2.59E-08 | 338 |
| 105 | 20.80 | 7.72E-05 | 1.53E-12 | 2.55E-08 | 339 |
| 106 | 21.00 | 7.85E-05 | 1.51E-12 | 2.51E-08 | 339 |
| 107 | 21.20 | 7.98E-05 | 1.48E-12 | 2.47E-08 | 340 |
| 108 | 21.40 | 8.10E-05 | 1.46E-12 | 2.43E-08 | 340 |
| 109 | 21.60 | 8.23E-05 | 1.44E-12 | 2.40E-08 | 341 |
| 110 | 21.80 | 8.36E-05 | 1.42E-12 | 2.36E-08 | 341 |
| 111 | 22.00 | 8.49E-05 | 1.39E-12 | 2.32E-08 | 342 |
| 112 | 22.20 | 8.62E-05 | 1.37E-12 | 2.29E-08 | 342 |
| 113 | 22.40 | 8.75E-05 | 1.35E-12 | 2.25E-08 | 343 |
| 114 | 22.60 | 8.89E-05 | 1.33E-12 | 2.22E-08 | 343 |
| 115 | 22.80 | 9.02E-05 | 1.31E-12 | 2.19E-08 | 344 |
| 116 | 23.00 | 9.16E-05 | 1.29E-12 | 2.15E-08 | 344 |
| 117 | 23.20 | 9.29E-05 | 1.27E-12 | 2.12E-08 | 345 |
| 118 | 23.40 | 9.43E-05 | 1.25E-12 | 2.09E-08 | 345 |
| 119 | 23.60 | 9.57E-05 | 1.24E-12 | 2.06E-08 | 345 |
| 120 | 23.80 | 9.71E-05 | 1.22E-12 | 2.03E-08 | 346 |
| 121 | 24.00 | 9.85E-05 | 1.20E-12 | 2.00E-08 | 346 |
| 122 | 24.20 | 9.99E-05 | 1.18E-12 | 1.97E-08 | 347 |
| 123 | 24.40 | 1.01E-04 | 1.17E-12 | 1.95E-08 | 347 |
| 124 | 24.60 | 1.03E-04 | 1.15E-12 | 1.92E-08 | 347 |
| 125 | 24.80 | 1.04E-04 | 1.14E-12 | 1.89E-08 | 348 |
| 126 | 25.00 | 1.06E-04 | 1.12E-12 | 1.87E-08 | 348 |
| 127 | 25.20 | 1.07E-04 | 1.10E-12 | 1.84E-08 | 349 |
| 128 | 25.40 | 1.09E-04 | 1.09E-12 | 1.82E-08 | 349 |
| 129 | 25.60 | 1.10E-04 | 1.08E-12 | 1.79E-08 | 349 |
| 130 | 25.80 | 1.12E-04 | 1.06E-12 | 1.77E-08 | 350 |
| 131 | 26.00 | 1.13E-04 | 1.05E-12 | 1.74E-08 | 350 |
| 132 | 26.20 | 1.15E-04 | 1.03E-12 | 1.72E-08 | 350 |
| 133 | 26.40 | 1.16E-04 | 1.02E-12 | 1.70E-08 | 351 |
| 134 | 26.60 | 1.18E-04 | 1.01E-12 | 1.68E-08 | 351 |
| 135 | 26.80 | 1.19E-04 | 9.93E-13 | 1.66E-08 | 351 |
| 136 | 27.00 | 1.21E-04 | 9.80E-13 | 1.63E-08 | 352 |
| 137 | 27.20 | 1.22E-04 | 9.68E-13 | 1.61E-08 | 352 |
| 138 | 27.40 | 1.24E-04 | 9.55E-13 | 1.59E-08 | 352 |
| 139 | 27.60 | 1.25E-04 | 9.43E-13 | 1.57E-08 | 353 |
| 140 | 27.80 | 1.27E-04 | 9.32E-13 | 1.55E-08 | 353 |
| 141 | 28.00 | 1.29E-04 | 9.20E-13 | 1.53E-08 | 353 |
| 142 | 28.20 | 1.30E-04 | 9.09E-13 | 1.51E-08 | 354 |
| 143 | 28.40 | 1.32E-04 | 8.97E-13 | 1.50E-08 | 354 |
| 144 | 28.60 | 1.33E-04 | 8.86E-13 | 1.48E-08 | 354 |
| 145 | 28.80 | 1.35E-04 | 8.76E-13 | 1.46E-08 | 354 |
| 146 | 29.00 | 1.37E-04 | 8.65E-13 | 1.44E-08 | 355 |
| 147 | 29.20 | 1.38E-04 | 8.55E-13 | 1.42E-08 | 355 |
| 148 | 29.40 | 1.40E-04 | 8.44E-13 | 1.41E-08 | 355 |
| 149 | 29.60 | 1.42E-04 | 8.34E-13 | 1.39E-08 | 356 |
| 150 | 29.80 | 1.43E-04 | 8.25E-13 | 1.37E-08 | 356 |
| 151 | 30.00 | 1.45E-04 | 8.15E-13 | 1.36E-08 | 356 |