**Variable names and Constants**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| S(ZN) | S(KN) | S(TS) | T(ZN) | T(KN) | T(TS) | S(Norm) | [NO3]μM |
| 36.052 | 33.885 | 34 | 19.3 | 22 | 20 | 35 | 45 |

Lambda- wavelength

T- Temperature

S- Salinity

I-Intensity

KN- Known Nitrate

ZN- Zero Nitrate

TS- Test Sample

**Calibration**

1. Measure intensity of Dark (DI water, S=0, [NO3-] =0, Shutter closed) 🡪 I(Dark)
2. Measure intensity of Blank (DI water, S=0, [NO3-] =0, Shutter open) 🡪 I(Blank)
3. Measure intensity and temperature of Known Nitrate Solution (Salinity🡪S(KN), [NO3-]🡪NO3-, Temperature🡪T(KN)) 🡪I(KN)
4. Measure intensity and temperature of Zero Nitrate Solution (Salinity🡪S(ZN), [NO3-] =0, Temperature🡪T(ZN)) 🡪I(ZN)
5. Find wavelength range using the spectrometer constants 🡪 Lambda
6. Calculate absorbance of Known Nitrate Solution 🡪 A(KN)
7. Calculate absorbance of Zero Nitrate Solution 🡪 A(ZN)
8. Calculate temperature corrected absorbances for Known Nitrate Solution 🡪 ASW(KN)
9. Calculate temperature corrected absorbances for Zero Nitrate Solution 🡪 ASW(ZN)
10. Calculate temperature corrected extinction coefficient at the known calibration temperature for Zero Nitrate Solution🡪 ESW(ZNcal)
11. Calculate the temperature corrected extinction coefficient for Zero Nitrate Solution🡪 ESW(ZN)
12. Calculate the expected absorbance due to sea salt for Zero Nitrate Solution at the in sea water temperature 🡪 ASE(ZN)
13. Calculate Nitrate Extinction Coefficient Zero Nitrate Solution 🡪 ENO3-

**Test Sample**

1. Measure intensity and temperature of Test Sample Solution (Salinity🡪S(TS), [NO3-] =??, Temperature🡪T(TS)) 🡪I(TS)
2. Calculate absorbance of Test Sample Solution 🡪 A(TS)
3. Calculate temperature corrected absorbances for Test Sample Solution 🡪 ASW(TS)
4. Calculate temperature corrected extinction coefficient at the known calibration temperature for Test Sample Solution🡪 ESW(TScal)
5. Calculate temperature corrected extinction coefficient for Test Sample Solution🡪 ESW(TS)
6. Calculate the expected absorbance due to sea salt (Organic matter) for Test Sample Solution at the in-sea water temperature 🡪 ASE(TS)
7. Calculate the absorbance A’ due to NO3- 🡪A’
8. Find concentration of nitration [NO3-] using multiple regression