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# Nucleic Acid and Protein: minimum detection levels

Detection limit depends on the measurement accuracy required by user. Spectrophotometer readings are subject to noise, which introduces error into concentration measurements. The error is greater the closer the measured Absorbance is to the stated specification for instrument noise. By convention, for a reading to be considered meaningful, it should be at least 2x the noise specification of the instrument.

Biowave II and Biowave DNA have noise around ±0.003A. The following two examples illustrate the effect of noise on measurement accuracy:

Example 1
Reading is 0.010A. This indicates a DNA concentration of 0.01 x 50 = 0.5µg/ml. But this reading could include noise of anything from -0.003A to +0.003A – so the true DNA concentration could be as low as 0.35µg/ml or as high as 0.65µg/ml – representing an error of ±30%

Example 2
Reading is 0.1A. This indicates a DNA concentration of 0.1 x 50 = 5µg/ml. Allowing for noise, the true concentration could be between 4.85 and 5.15µg/ml. So this time the error is just ±3%

## Factors

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|---|---|
| DNA: | 50 x Abs260 = concentration in µg/ml |
| RNA: | 40 x Abs260 = concentration in µg/ml |
| Oligos: | 33 x Abs260 = concentration in µg/ml |
| Protein (BSA) | 1.115 x Abs280 = concentration in mg/ml |