



Biochrom Ltd
22 Cambridge Science Park
Cambridge
CB4 0FJ England
Telephone: +44 (0)1223 423723
Fax: +44 (0)1223 420164
E-mail: enquiries@biochrom.co.uk
Website: www.biochrom.co.uk

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 $\pm 0.003A$. The following two examples illustrate the effect of noise on measurement accuracy:

Example 1

Reading is 0.010A. This indicates a DNA concentration of $0.01 \times 50 = 0.5\mu\text{g/ml}$. But this reading could include noise of anything from $-0.003A$ to $+0.003A$ – so the true DNA concentration could be as low as $0.35\mu\text{g/ml}$ or as high as $0.65\mu\text{g/ml}$ – representing an error of $\pm 30\%$

Example 2

Reading is 0.1A. This indicates a DNA concentration of $0.1 \times 50 = 5\mu\text{g/ml}$. Allowing for noise, the true concentration could be between 4.85 and $5.15\mu\text{g/ml}$. So this time the error is just $\pm 3\%$

Factors

DNA:	$50 \times \text{Abs}_{260} = \text{concentration in } \mu\text{g/ml}$
RNA:	$40 \times \text{Abs}_{260} = \text{concentration in } \mu\text{g/ml}$
Oligos:	$33 \times \text{Abs}_{260} = \text{concentration in } \mu\text{g/ml}$
Protein (BSA)	$1.115 \times \text{Abs}_{280} = \text{concentration in mg/ml}$



Biochrom Ltd
Certificate No:
890333

A Harvard Bioscience Company

Registered in England No: 3526954
Registered Office: 22 Cambridge Science Park, Milton Road,
Cambridge, CB4 0FJ England