

ANALYTICAL Calculator
The multi functions calculator for chemistry and LifeScience
(Stoichiometric-, Biochemical and Lexical functions)



An innovative product simplifies daily lab routine

for all branches of industry, public offices and educational institutions performing calculations in chemistry and molecular biology.

Features

periodic system keyboard
numerical keyboard
two-lined display
comprehensive range of functions

- **A keyboard representing the complete periodic system** serves for the quick input of the molecular weights (or formula weights) of compounds in order to use them for further calculations. The periodic system keyboard is supplemented by an usual numerical keyboard. **Thus stoichiometric calculations can be performed faster and easier than with any other conventional means.**
- **Four keys representing the nucleotides of DNA (A, T, G, C) and of RNA (A, U, G, C)** serve for the quick input of the molecular weights of single nucleotides and oligonucleotides.
- **A two-lined display** with scroll-functions offers enough place to have a complete view even at longer compound formulae put in into the first line. The scroll function makes it possible to look at symbols put in, whose position in the first line reaches over the actual length of the display. The scroll-function is especially of advantage as regards the input of oligonucleotides when working with **biochemical functions**. The second line serves to indicate the result of calculations.

Range of Abilities

The numerous functions can mainly be called by pressing **two keys (MF: Mainfunctions and SF: Subfunctions) that lead through the menu display** in the left part of the first line (e.g. "SOL" = solutions; "C1" = Concentrations 1 ...). There are:

stoichiometric functions
 biochemical functions (mainly related to PCR)
 lexical functions

Some functions for scientific calculations have also been integrated. They can mainly be called by pressing the button "inv" and another key in order to call the double function of this key.

Stoichiometric Functions

```
M1 C2H12O6
M = 180.157 g/mol
```

```
Sol n/V[mol/l] → m[g]
[x] = 2.5 mol/l
```

The **a**NALYTICAL

indicates directly after input of a substance's compound formula:

- the substance's molecular weight and gas volume;
- after additional input of the substance's amount in mol: the substance's mass in g;
- or after additional input of the substance's mass in g: the substance's amount in mole;

calculates in the menus "Formula" und "Element Part(ition)":

- the compound formula (after input of the percentage composition of each element and knowledge of its molecular weight);
- the part of single elements or element groups in grammes or percentage;

calculates for mixing solutions of any concentrations (mol / l):

- the masses of the substances needed in g;

converts for solutions into one another:

- moles of a solute per volume (mol / l; molarity) into the mass of a solute per volume (g / l) and vice versa;
- mass percent of a solute into molarity;

calculates for diluting:

- the volumes needed in Liter;

calculates for titrations:

- the amounts of substances needed in mmol.

Biochemical Functions

Functions Related to PCR (Polymerase Chain Reaction)

```

348
GeD ATGGCTGGCTTG
STAAlaGlyLeu
  
```

```

348
GeD ATGGCTGGCTTG
1A4T5G2C 58.33% GC
  
```

```

348
Gel Molecular Weight 1
M1 = 3829.44 g/mol
  
```

The aNALYTICAL

indicates directly after input of a sequence of nucleotides (buttons A, T / U, G, C in special menus for DNA and RNA):

- the amino acid (as three-letter-code) corresponding to the three bases of a codon;
- the percentage of the complementary base pairs Guanin and Cytosin;
- the molecular weight of the nucleotide sequence as single-strand and as double-strand;
- the molecular weight of the protein coded by the nucleotide sequence put in;

indicates after additional input of the optical density:

- the amount of oligonucleotides synthesized in nmol;

indicates after putting in the amount of oligonucleotides synthesized in nmol:

- the optical density of the DNA solution;

indicates after putting in the nmol of the DNA solute (1ml):

- the mass of the oligonucleotides in ng;

indicates after input of the concentration of Na⁺ (in mol / l):

- the melting temperature of the oligonucleotide put in.

a submenu offers a survey of the base triplets which code an amino acid.

Lexical Functions

```

348
Lib Hydrogen
f.ion.pot. 13.598 V
  
```

The aNALYTICAL

converts into one another:

- temperature in Celsius, Fahrenheit and Kelvin;



has a key for putting into calculations / indicating

- the atomic mass unit "u";

has a menu for indicating different constants:

- Avogadro's number;
- Faraday constant and other data;

offers functions for indicating chemical, physical and biological characteristics of the elements and other data, e.g.:

- melting point;
- boiling point;
- electronegativity;
- year of discovery; and other data;

offers space for memorizing up to 30 individually needed values / results with a maximum of ten in every of the three groups of functions:

- stoichiometry;
- Molecular biology (PCR);
- calculator.

Customer Benefits of the aNALYTICAL

saves time: Calculations are much faster as with conventional means.

Beneath other reasons this is made possible by the easy-to-handle and clear periodic system keyboard.

saves place: Easy to keep - only 136 x 110 x 14 mm of size.

Thus the aNALYTICAL will become your steady companion.

saves money: Working time and use of expensive tables are reduced.

Most time-consuming calculations belong now to the past. You can focus on the essential actions and work more efficiently.

mobility: Immediate calculations are possible - at any time, anywhere.

Perform your calculations directly beneath your lab-equipment without having to go back to your Computer at your work station.

safety: Closed case prevents damage.

This is an decisive advantage in comparison to a PC or a notebook when working in a laboratory or outdoor.

Input errors are avoided.

E.g. you have to press only one button of the periodic system keyboard in order to put in the molar mass of an element.