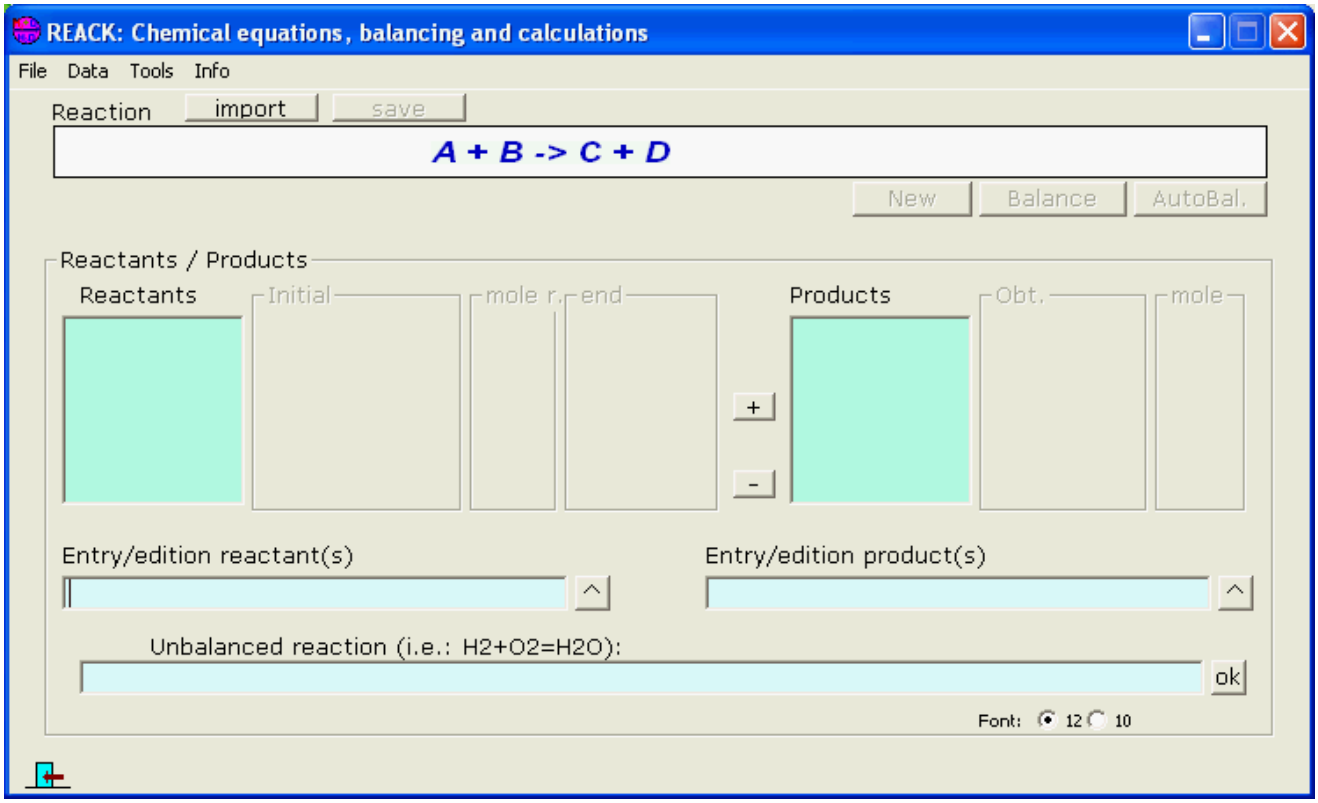
# REACK

## Balancing and calculations on chemical equations




- Reactions: importing and editing
- Balancing a reaction
- Calculations on a chemical equation
- Problem

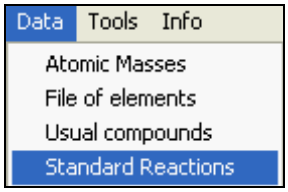
# Reactions: importing and editing

Only are supported “molecular” (not ionic) reactions, and they only may consist in formulas and coefficients (not other indications)

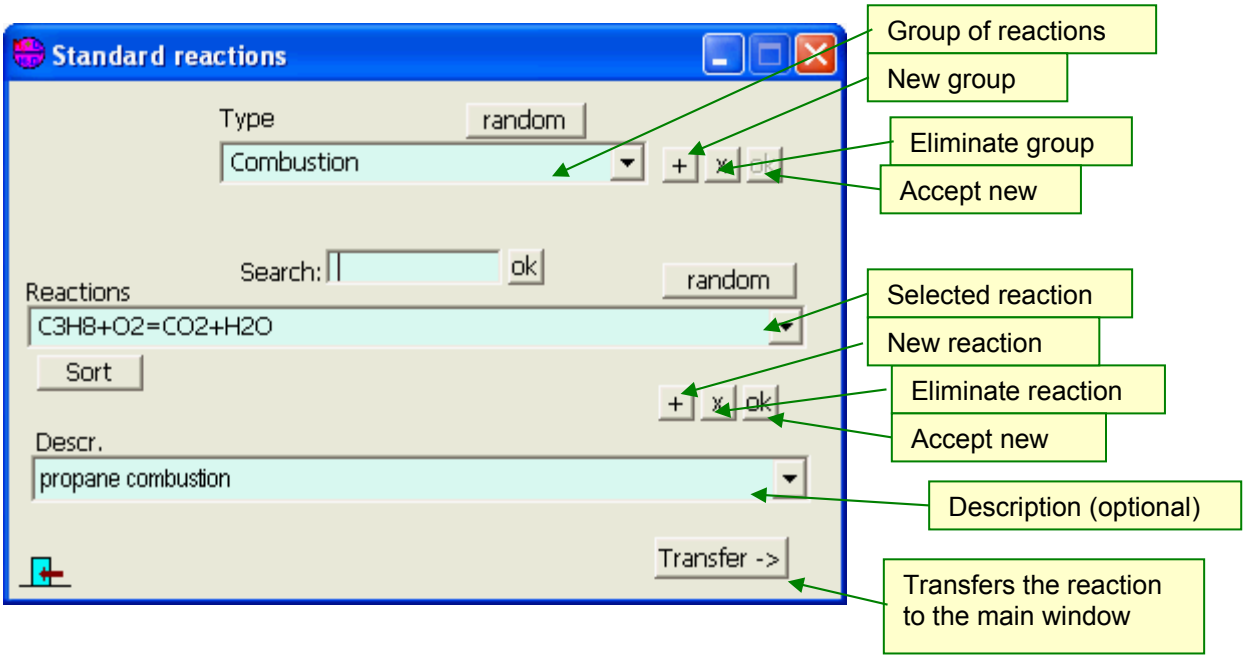

- Importing standard reactions
- Building /editing manually a chemical equation


## Importing standard reactions

Clicking on the menu **Data** the option…



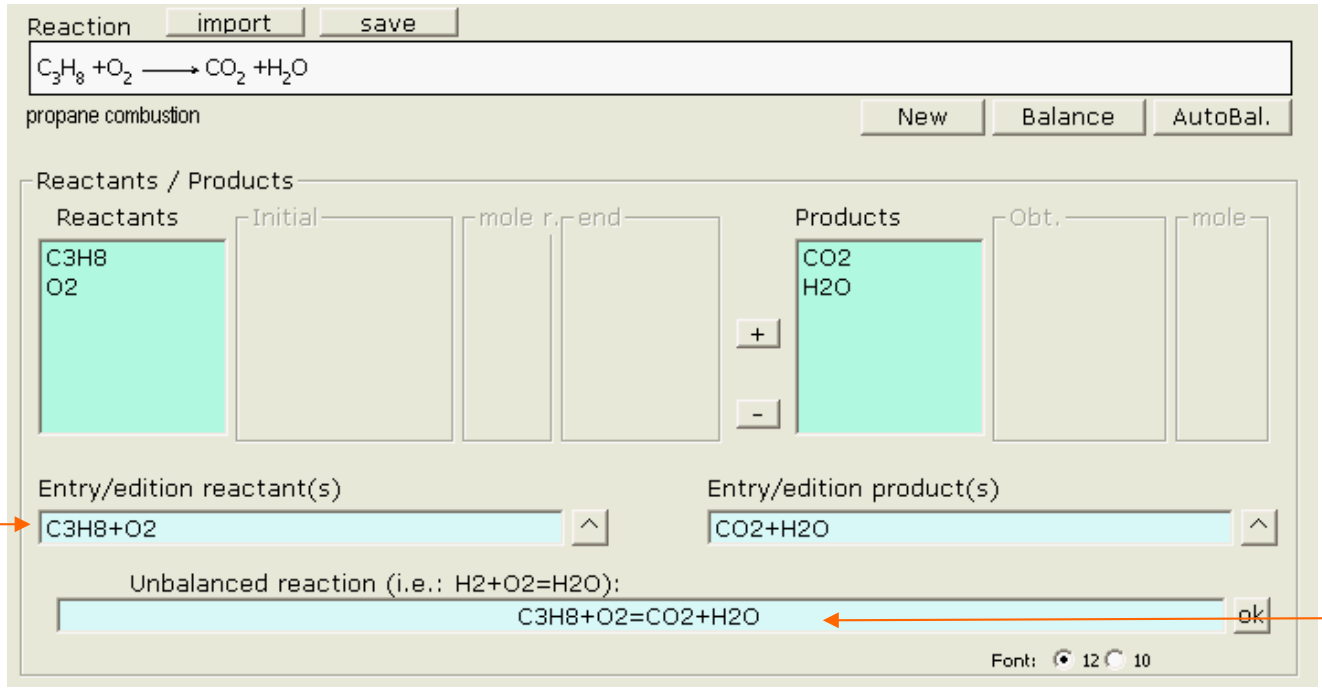

the window that connects with the database of standard reactions is shown



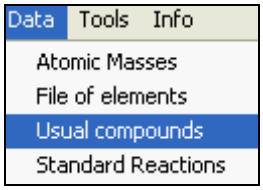

As you can see, here it’s possible also modify and eliminate reactions and groups of them.

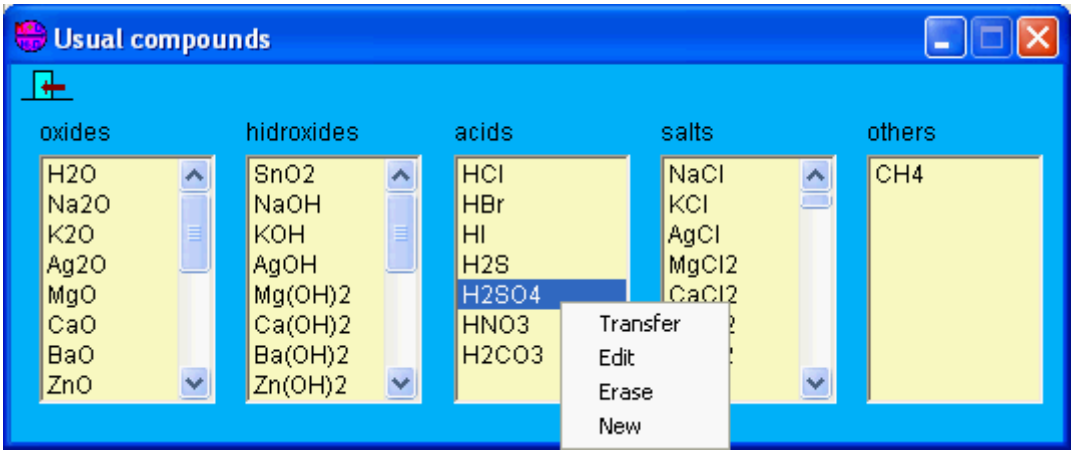
# Building / editing manually a chemical equation

Introducing the reactants and products in their textboxes, the (not balanced) chemical equation will be formed. Also you can enter the full reaction.




An option to introduce formulas without writing them is to invoke the window of ***usual compounds***…



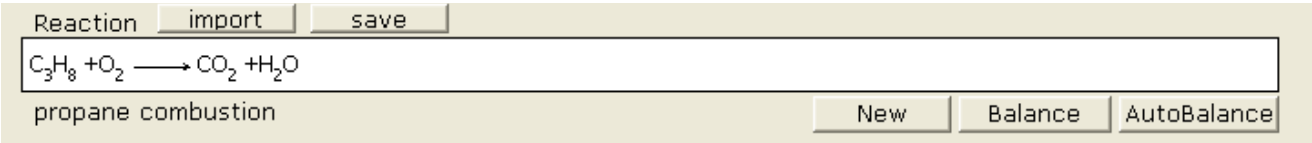




Here you have these options:

- **Transfer** selected formula to the main window
- **Edit** formula (and name)
- **Erase** compound
- **New:** incorporate new compounds

# Balancing a reaction

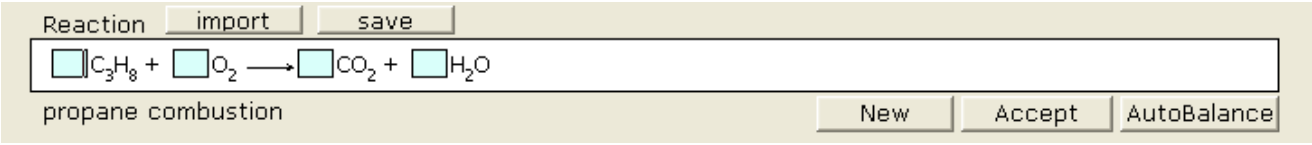
Once obtained a reaction, we must balance its equation so that it reflects the proportion in moles of the implied compounds.




- Manual balancing
- Autobalancing

## Manual balancing: Click on Balance

Then, the textboxes to introduce the coefficients of reactants and products are shown.

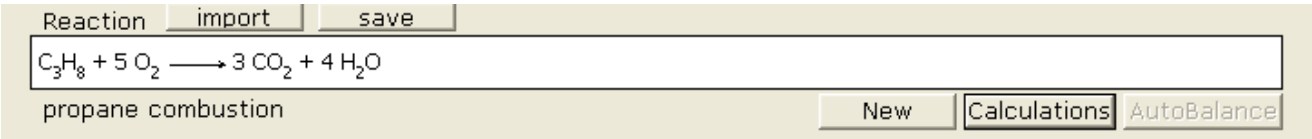



Clicking on Accept the program will accept the balance if it is correct or it will show error messages if not .

## Autobalancing: Clicking on AutoBalance the program will calculate the coefficients.

This option is not advisable from the point of view of learning, but it will be useful when you want to pass directly to the phase of calculations.

Anyway, you'll obtain the balanced equation:




Note about **autobalancing**: the method is purely mathematical and, although rarely, in the Redox reactions can give a result mathematically correct but chemically false, that is: such that the number of electrons given by the reducer is different from the one captured by the oxidizer. An example:

The reaction $KMnO_4 + H_2S + H_2SO_4 = MnSO_4 + S + K_2SO_4 + H_2O$, if balanced by the mathematic method gives $2\ KMnO_4 + 2\ H_2S + 2\ H_2SO_4 = 2\ MnSO_4 + S + K_2SO_4 + 4\ H_2O$, that is compliant with the mass conservation, but balanced by the ion-electron method yields the chemically actual equation:

$$2\ KMnO_4 + 5\ H_2S + 3\ H_2SO_4 = 2\ MnSO_4 + 5\ S + K_2SO_4 + 8\ H_2O$$

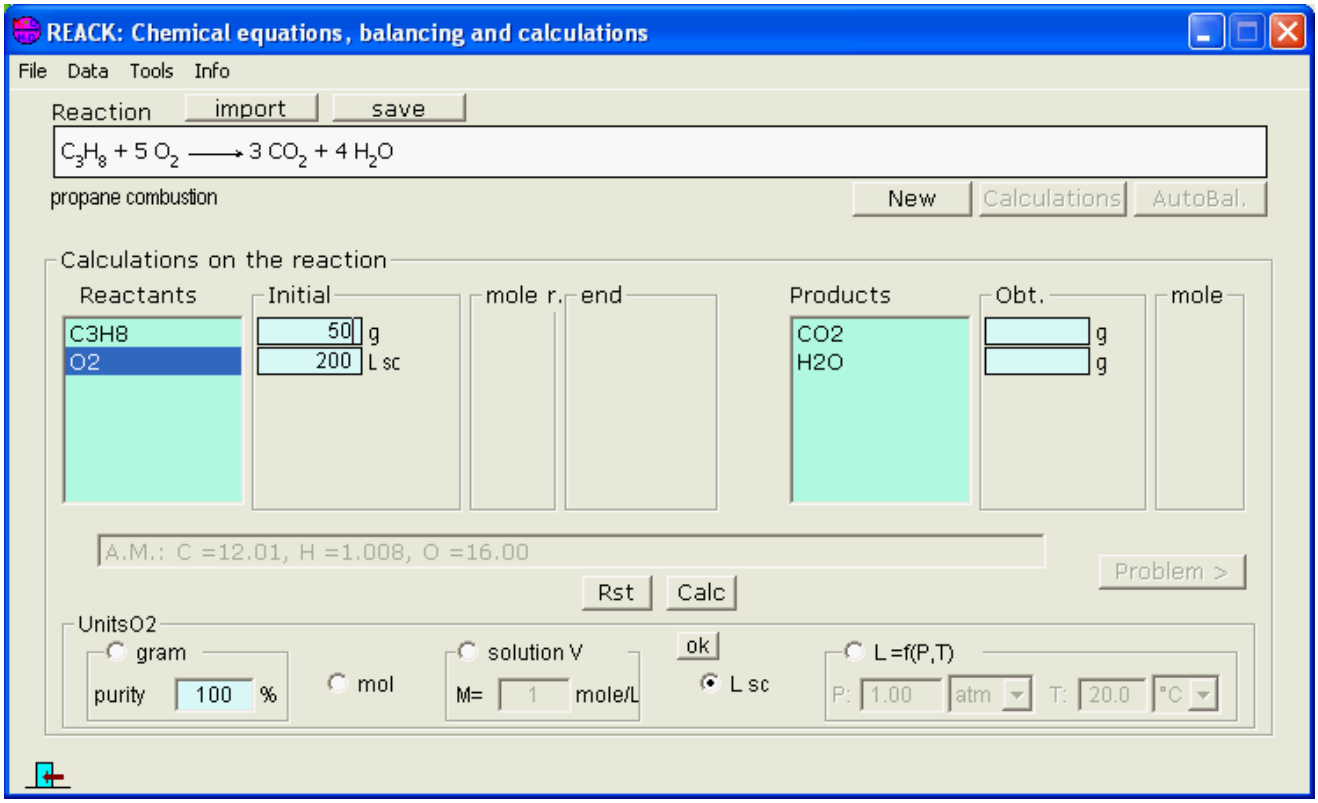
## Calculations based on a (balanced) reaction:

Once balanced the equation, clicking on Calculations the textboxes for introduce data and present results will be shown.

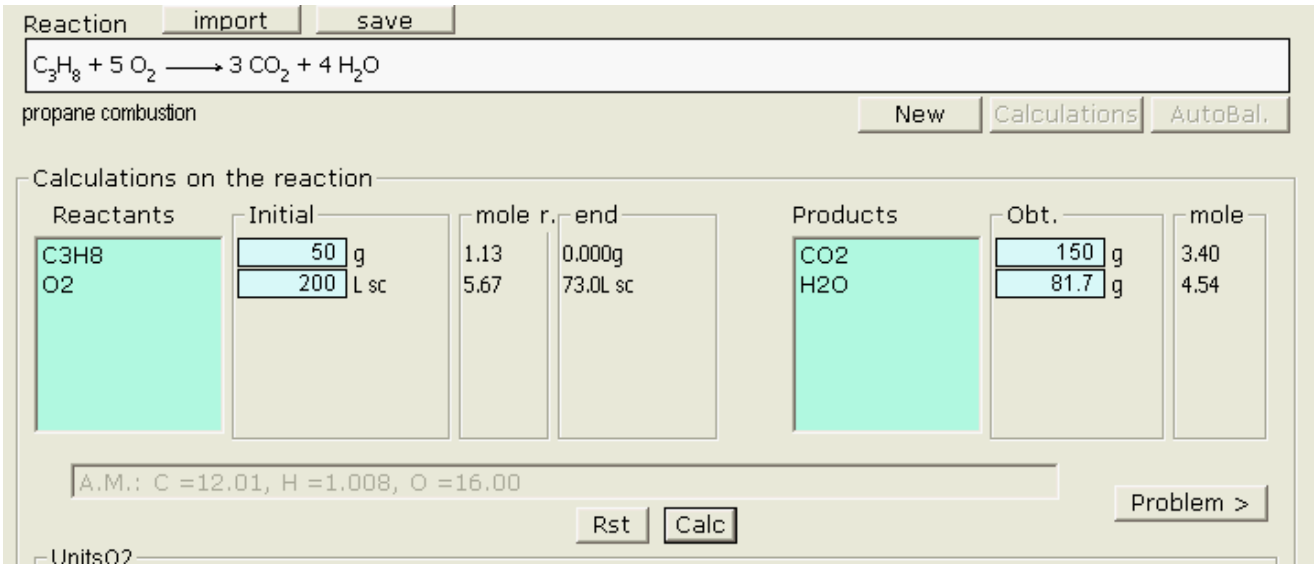
You can introduce data of:

- One or more reactants (if more than one, the limiting reactant will be calculated).
- Or only one product (if more, they will be ignored).

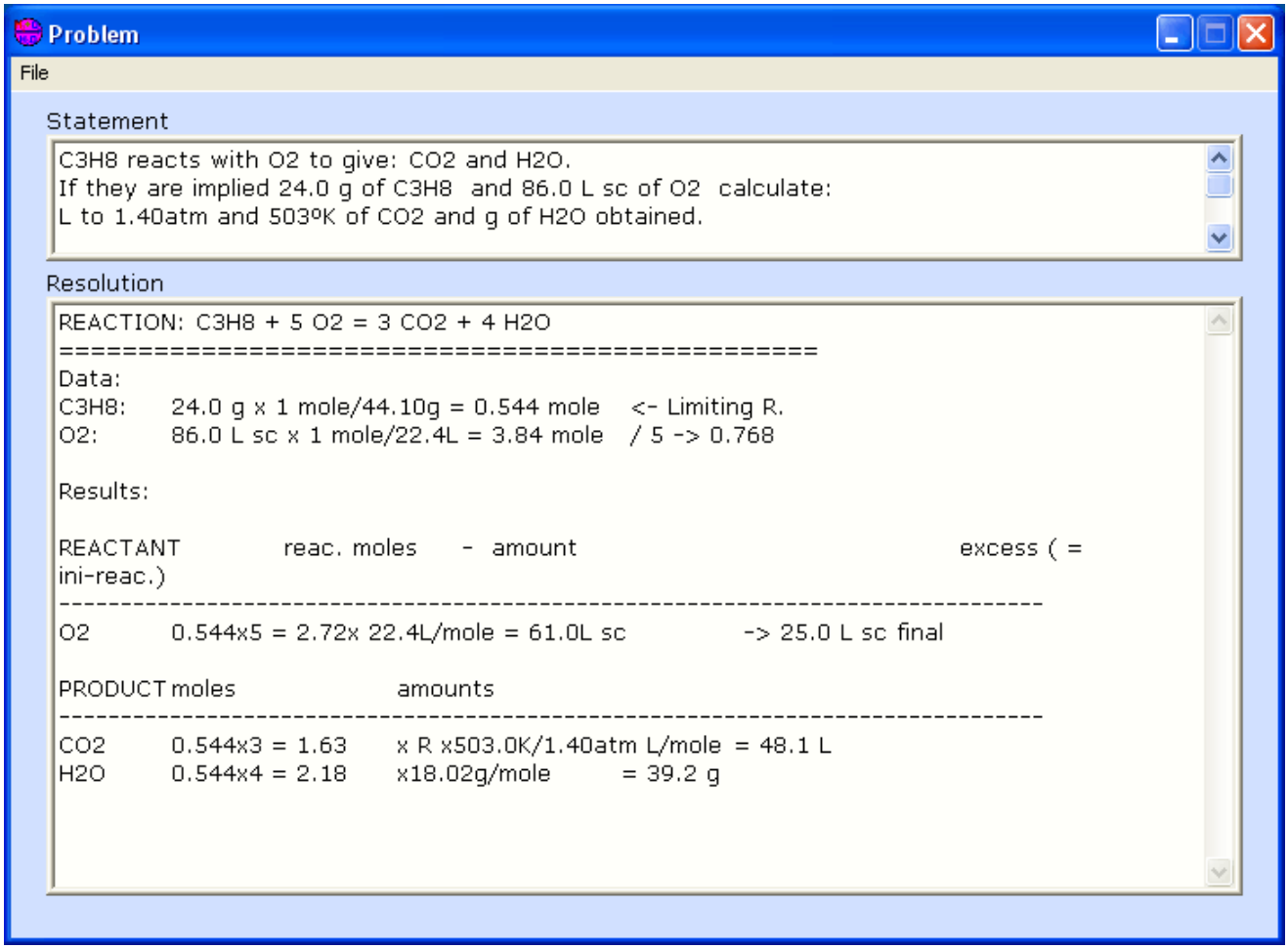
The units of those (grams by default) can also be chosen here.

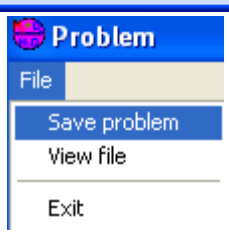



Clicking on Calc after the introduction, results are shown in the empty textboxes:



**Problem**: Clicking on Problem > the problem will be shown:

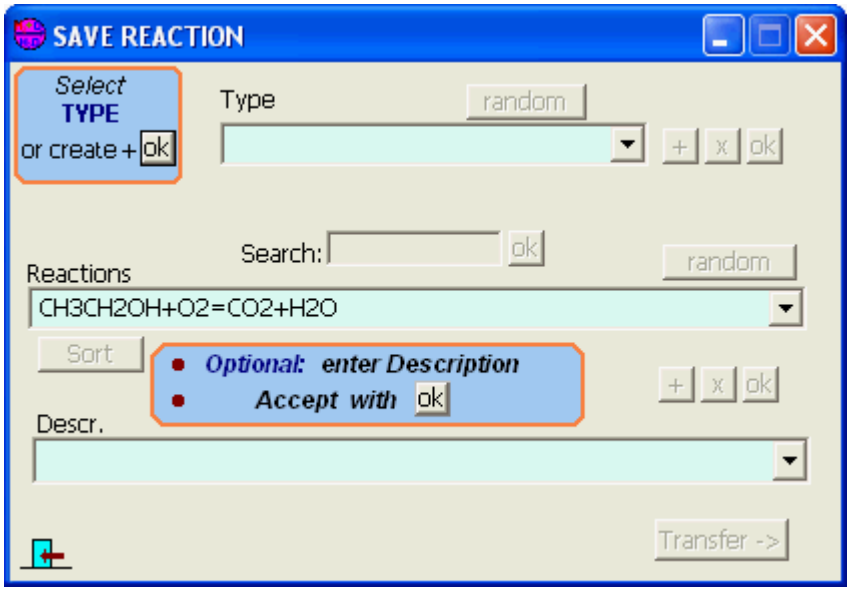


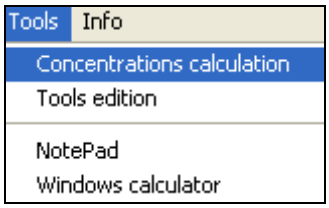

It can be saved in a text file. If the file already exists the problem will be added to it, and if not it will be created.

## Saving the reaction:

The entered reaction can be saved in the reactions database clicking on save :



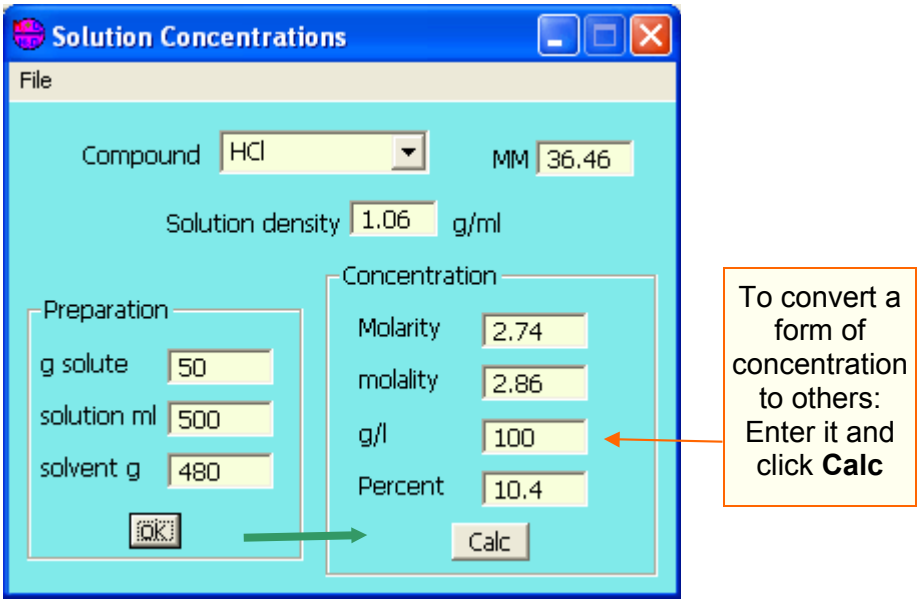
# Concentrations calculation




Option of **Tools** menu.

By selecting a compund from the list we can calculate, from the data of preparation of a solution their different expressions of concentration.

Also a form of concentration can be converted to others.




To convert a form of concentration to others: Enter it and click **Calc**


*Send any comment, suggestion or questions to:*

jog@scialt.com


*More apps in the web:* ***http://www.scialt.com/en***