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## Reaction Menu

This menu can be used to create a new reaction or to exit the program.

### Graph Item

Clicking on this item will allow the user to view three graphs. The first graph plots number of molecules of X left ( $[X]$ ) vs. time, the second the log of  $[X]$  vs. time, and the third  $1/[X]$  vs. time. The most linear of the three plots will show the user the order of the reaction, either zero, first, or second respectively. All three graphs can be printed by clicking on Rprint. Clicking on return to bring the original window back in the state it was in previously.

### Purpose of the program

Kinetics can be a difficult subject to teach because it is hard to visualize what is occurring at the molecular level when a chemical reaction proceeds. This program allows the student to view a representation of a chemical reaction at the molecular level. Parameters such as temperature and the presence of a catalyst can also be controlled with the program. The reaction order can be determined by clicking on the graph item. A lab which can be used with the program is included with the registered copy. See register.txt for more information.

### Pause Item

Clicking on this item freezes the action so that data and observations can be made. The reaction may be restarted by using restart . This option does not work with the unregistered version. See register.txt for more information.

### Restart Item

This item will restart a reaction that has been stopped with pause . This option does not work with the unregistered version. See register.txt for more information.

### New Item

Choosing this menu item will allow the user to start a new reaction with a user determined number of molecules of X, a temperature of 25°C or 35°C, and the use of a catalyst. Enter the number of molecules of X desired in the box provided. Use the mouse or Tab key to move around the dialog box and to enter the temperature and whether a catalyst is present. You may have no more than a total of 80 molecules. The reaction will then start.

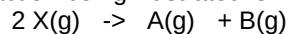
**Exit**

To quit the program select this menu item or press Alt-x.



### Window Appearance

When a reaction is started by selecting new from the reaction menu a box will appear in the upper left hand corner of the window. This is the reaction vessel. The molecules of A , B , and X will move at various speeds in a manner similar to that which would occur at the molecular level during an actual chemical reaction. The reaction being illustrated is:



This reaction is similar in mechanism to the classic reaction which occurs between hydrogen iodide vapor to produce gaseous hydrogen and iodine. When molecules of X collide they may react to form a molecule of A and B depending on the reaction conditions. The actual number of molecules of each species can be found on a table below the reaction vessel. In the upper right hand corner a table including the elapsed time since the beginning of the reaction and the average number of A, B, and X molecules is presented.

In the lower right hand corner of the screen there is a graph which relates the number of molecules present vs. time. The graph shows the student a very clear representation of what is happening as the reaction proceeds. Every 100 seconds the graph will be refreshed.

