

Decomposition of H2O2

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This is a Mathematica notebook to illustrate the analysis of data concerning the decomposition of H2O2.

The times at which concentration data was taken (seconds):

```
In[2]:= times = {0, 120, 300, 600, 1200, 1800, 2400, 3000, 3600}
```

The measured concentration (moles per liter) at each time:

```
In[4]:= data = {1.00, 0.91, 0.78, 0.59, 0.37, 0.22, 0.13, 0.08, 0.05}
```

Make a logarithmic transformation of the concentrations

```
In[8]:= logdata = Log[data]
```

And plot (first install into 2 x 6 matrix "pdata"):

```
In[39]:= pdata = Transpose[{times, logdata}];  
plt1 = ListPlot[pdata,  
  AxesLabel → {"time (seconds)", "log(concentration)"}, AxesOrigin → {0, -3.2}]
```

Fit a line (degree 1 polynomial) of the form $y = c(1)*times + c(0)$ to the data

```
In[24]:= line = Fit[pdata, {1, x}, x]
```

Evaluate line at each time, superimpose a graph of the line on a plot with the log data

```
In[43]:= plt2 = Plot[line, {x, 0, 3600}, PlotStyle → {Red}];  
Show[plt1, plt2,  
  AxesLabel → {"time (seconds)", "log(concentration)"}, AxesOrigin → {0, -3.2}]
```