

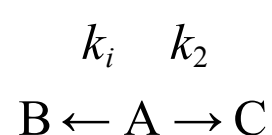
Fig. 7.4 • (a) Plot of concentration against time. (b) Plot of $1/\text{concentration}$ against time. (c) Plot of $\ln(\text{concentration})$ against time. Data plotted from Example 7.4.

assumptions may be true and the *overall* order, being the result of several reactions, may not be zero, first or second order but have a fractional value.

There are three basic types of complex behaviour.

Parallel (side) reactions

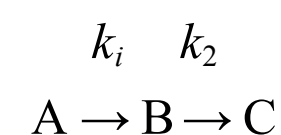
Here reactants A form a mixture of products:



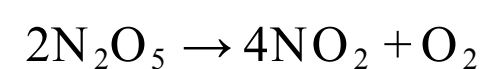
Usually only one of the products is desirable, the others are byproducts.

$$(\text{Yield of B} / \text{Yield of C}) = k_1 / k_2$$

Series (consecutive) reactions



If $k_1 \gg k_2$ then a build-up of B occurs. The second (slower) step is then the 'rate-determining' step of the reaction, and the overall order is approximately that of the rate-determining step. Thus the reaction:



is composed of two consecutive reactions as discussed previously:

