INTRODUCTION

In this series of papers chemical reactions in a feedback controlled chemical reactor (FCCR) were studied. By injection of one reaction component into the other the absorbance of reaction mixture is kept at a constant value [1,2].

The principle of the method is obvious from Fig. 1. The solution of the first reaction component B is in reactor 1,
the solution of the second component A is injected by dispenser 4. The absorbance \( A \) (or transmittance \( T \)) of the reaction mixture indicated by photocell 2 is compared continuously in compensator 3 with an adjusted value \( A_o \). The difference of both values is taken to a linear dispenser 4 and injection is therefore controlled by feedback. The time dependence of volume content is monitored by detector 5.

**THEORETICAL**

For irreversible non-isochoric reaction of 2nd order

\[
|v_A|A + |v_B|B \xrightarrow{k} |v_A|C + |v_B|D
\]  

with injection of volume \( V_A \) (cm\(^3\)) by FCCR of component A or concentration \( c_A \) (mol dm\(^{-3}\)) into the given solution of component B of volume \( V_O \) (cm\(^3\)) and concentration \( b_B \) (mol dm\(^{-3}\)) the differential equation [1] for constant absorbance \( A_o \) is

\[
\frac{a_A}{v_A} \frac{dv_A}{dt} = k \frac{(n_A k^c (c_A - |v_A| A_A)|v_A| (n_B k^b |v_B| A_B |v_A|)}{(v_O + v_A)}
\]  

where

\[
a_A = (c_A - c_A O) / (|v_A| (k_A - k_A C) + |v_B| (k_B - k_B D))
\]