

Fig.1

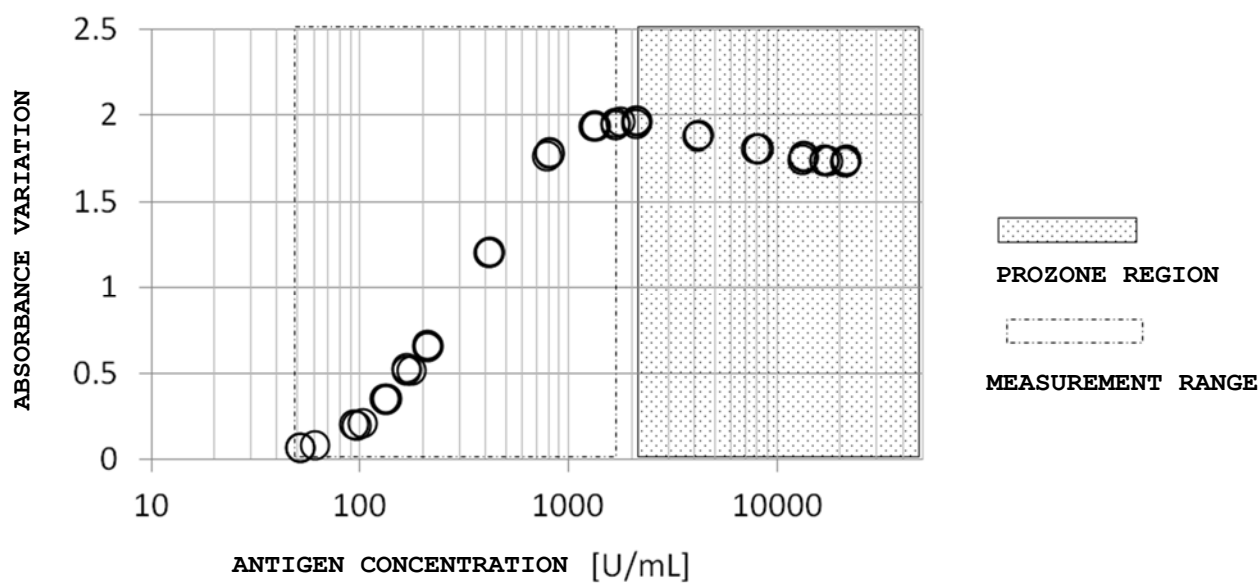
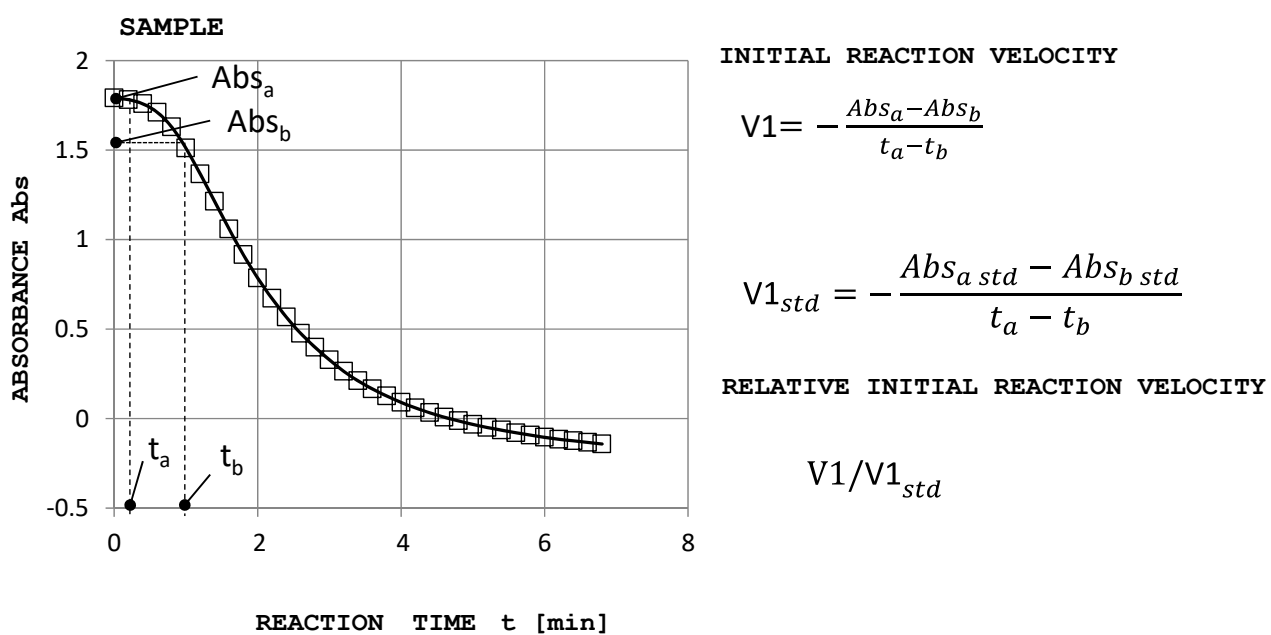


Fig.2



The graph plots Absorbance (Abs) on the y-axis (ranging from -0.5 to 2.0) against Reaction Time t [min] on the x-axis (ranging from 0 to 8). A series of data points (squares) shows a decreasing trend. Four specific points are marked with dots and labeled Abs_a , Abs_b , Abs_c , and Abs_d . Vertical dashed lines from these points to the x-axis are labeled t_a , t_b , t_c , and t_d respectively. Horizontal dashed lines connect the points to the y-axis.

REACTION VELOCITY RATIO

$$R = \frac{\frac{Abs_c - Abs_d}{t_c - t_d}}{\frac{Abs_a - Abs_b}{t_a - t_b}}$$

RELATIVE REACTION VELOCITY RATIO

$$R_{std} = \frac{\frac{Abs_{cstd} - Abs_{dstd}}{t_c - t_d}}{\frac{Abs_{astd} - Abs_{bstd}}{t_a - t_b}}$$

R/R_{std}

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graph TD
    subgraph Calibration_Process [CALIBRATION PROCESS]
        CS[REACTION START] --> CE[REACTION END]
        CE --> CCA[PREPARE CALIBRATION CURVE OF ABSORBANCE VARIATION]
        CCA --> CS
    end

    subgraph Measurement_Process [MEASUREMENT PROCESS]
        MS[REACTION START] --> MPD{PROZONE DETERMINATION}
        MPD --> ME[REACTION END]
        ME --> MR[MEASUREMENT RESULT]
        MR --> EN1[END]

        MS --> MCD{HIGH CONCENTRATION DETERMINATION}
        MCD -- No --> MD[10-FOLD DILUTION]
        MD --> MS2[REACTION START]
        MS2 --> ME2[REACTION END]
        ME2 --> MR2[MEASUREMENT RESULT]
        MR2 --> EN2[END]

        MCD -- YES --> MCD2{HIGH CONCENTRATION DETERMINATION}
        MCD2 -- YES --> MD2[100-FOLD DILUTION]
        MD2 --> MS2
        MCD2 -- No --> MPD
    end

    CS --> MPD
    CE --> MPD
    CE --> CCI[CALCULATE INITIAL REACTION VELOCITY V1st]
    CCI --> MPD
    CE --> CCR[CALCULATE REACTION VELOCITY RATIO Rst]
    CCR --> MPD
    CCA --> MR
    CCA --> MR2

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Fig.5

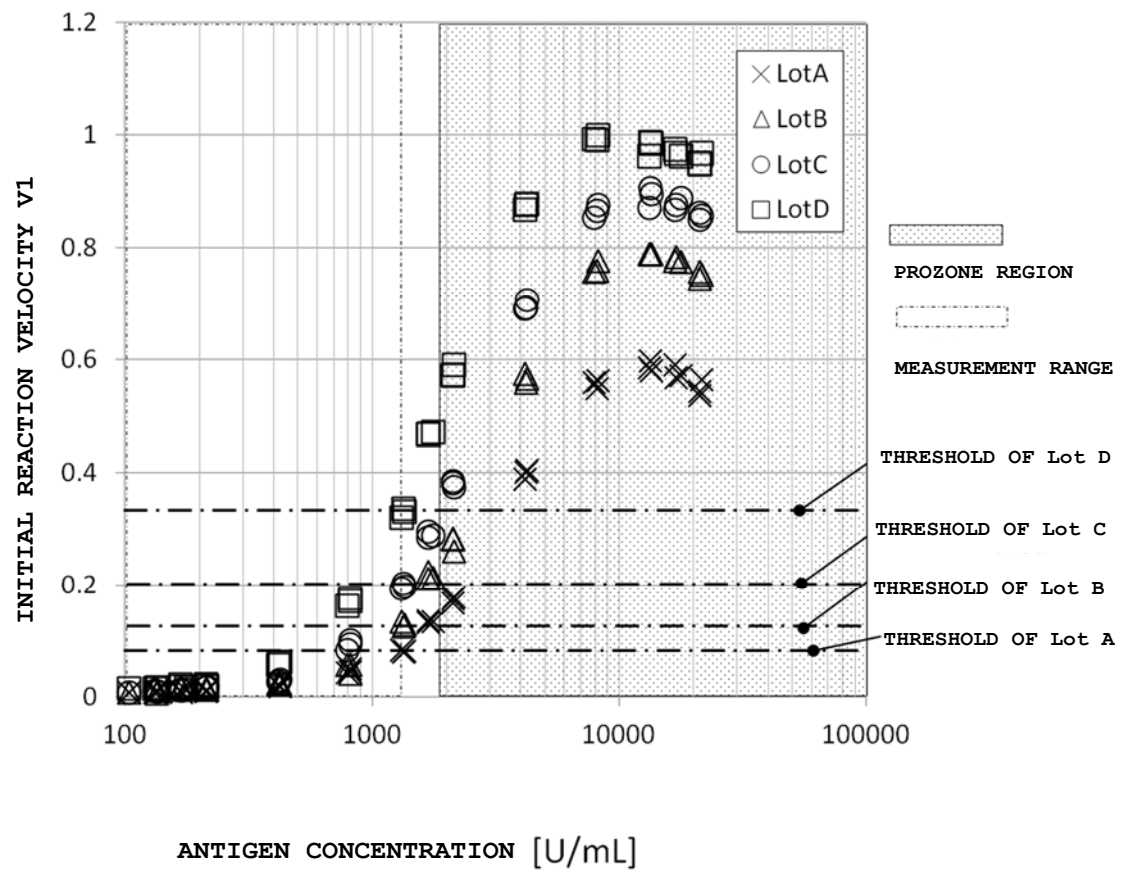


Fig.6

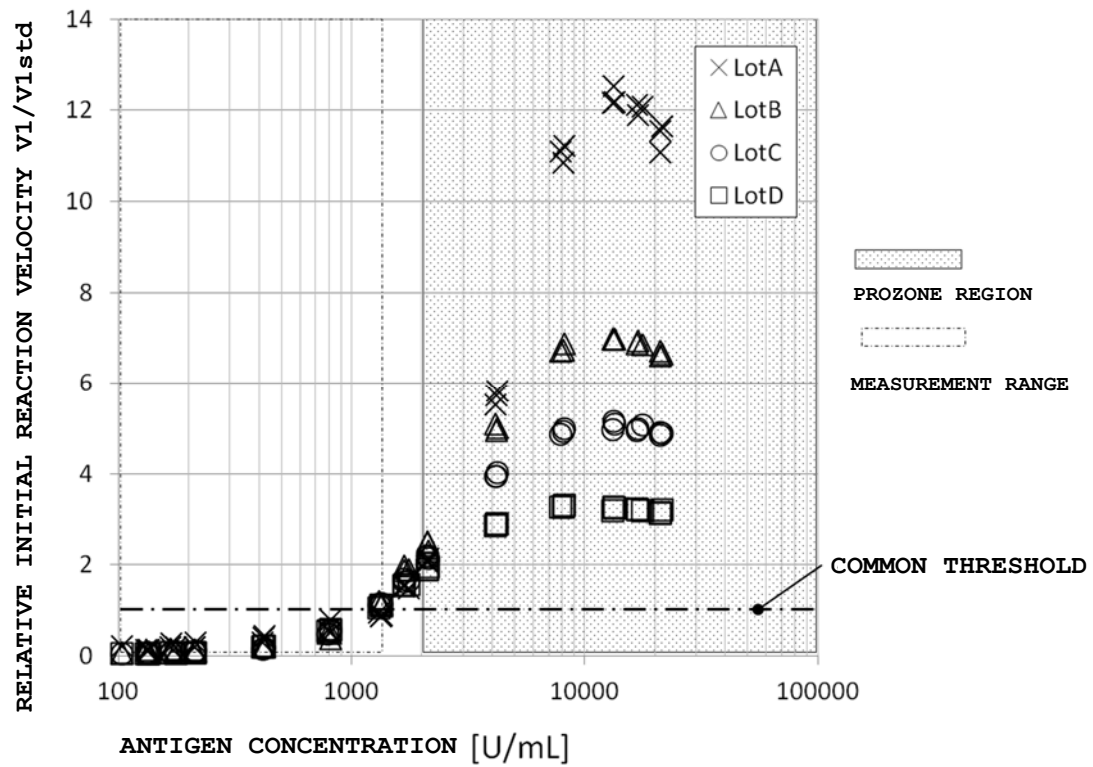


Fig.7

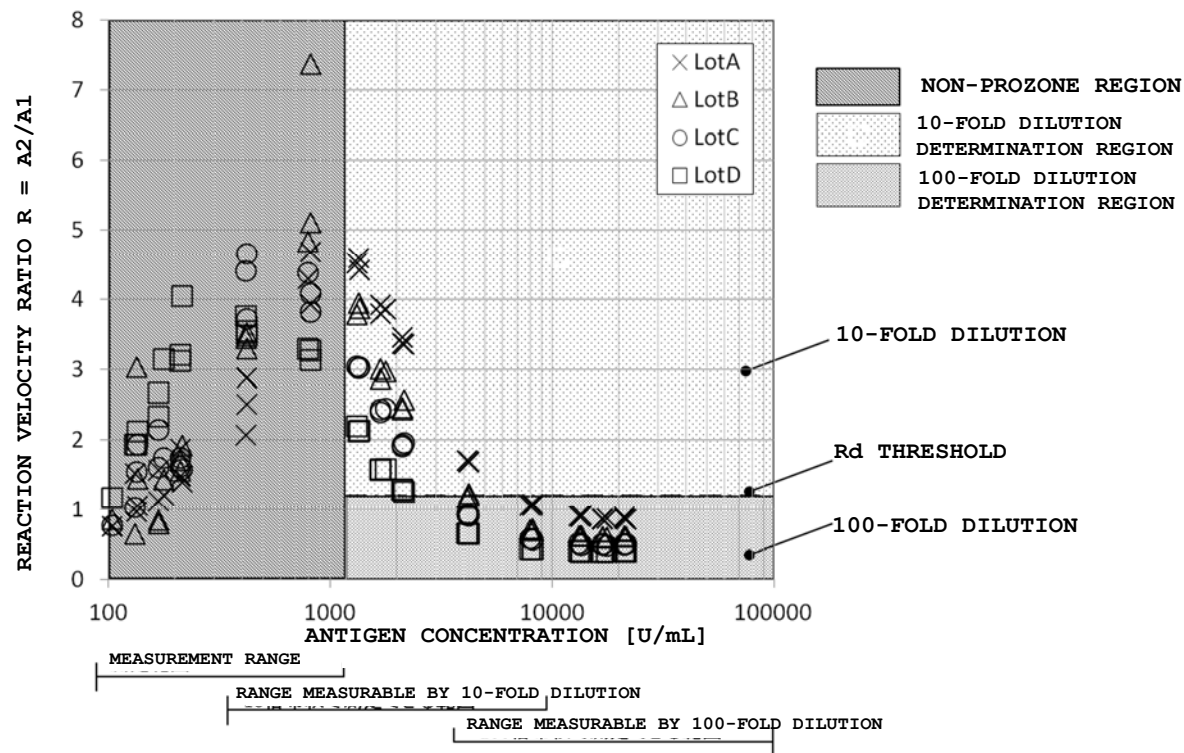


Fig.8

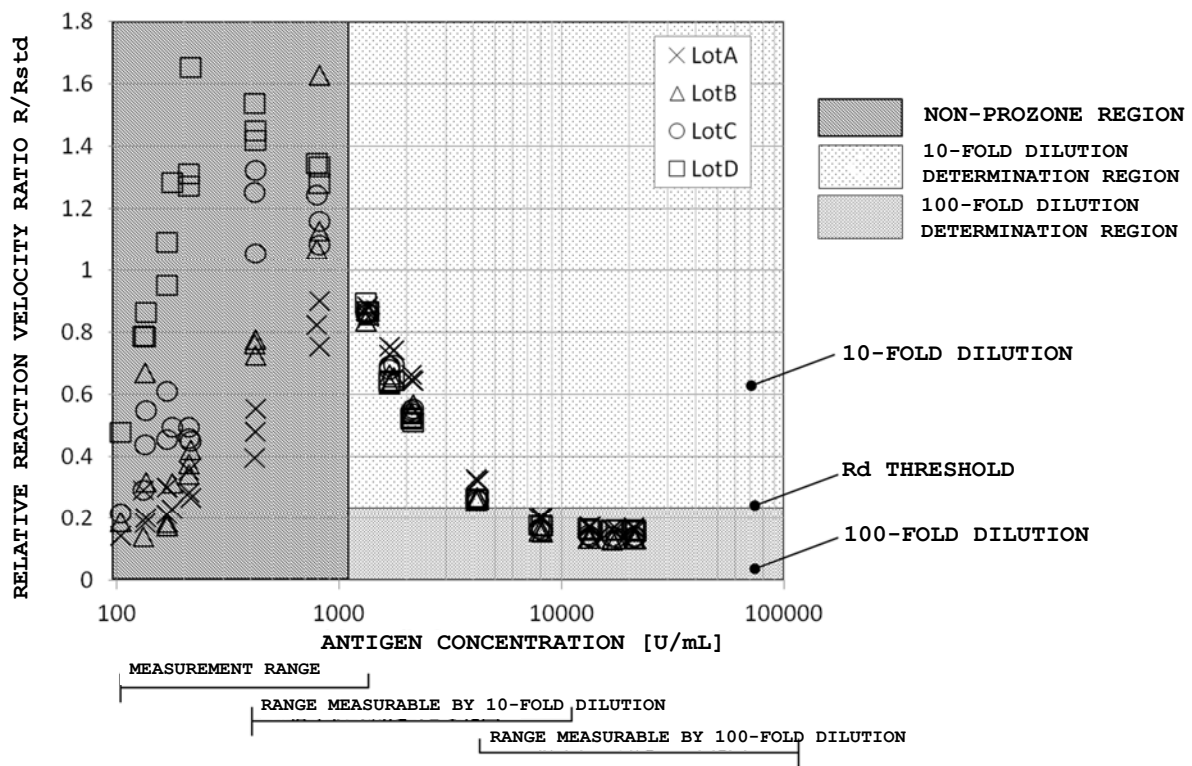


Fig.9

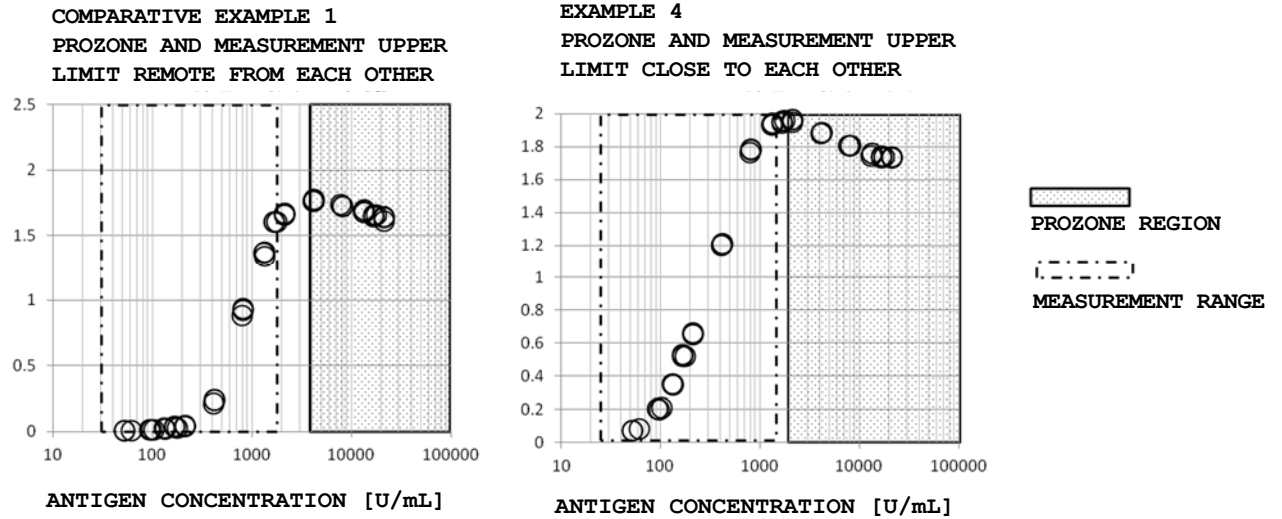


Fig.10

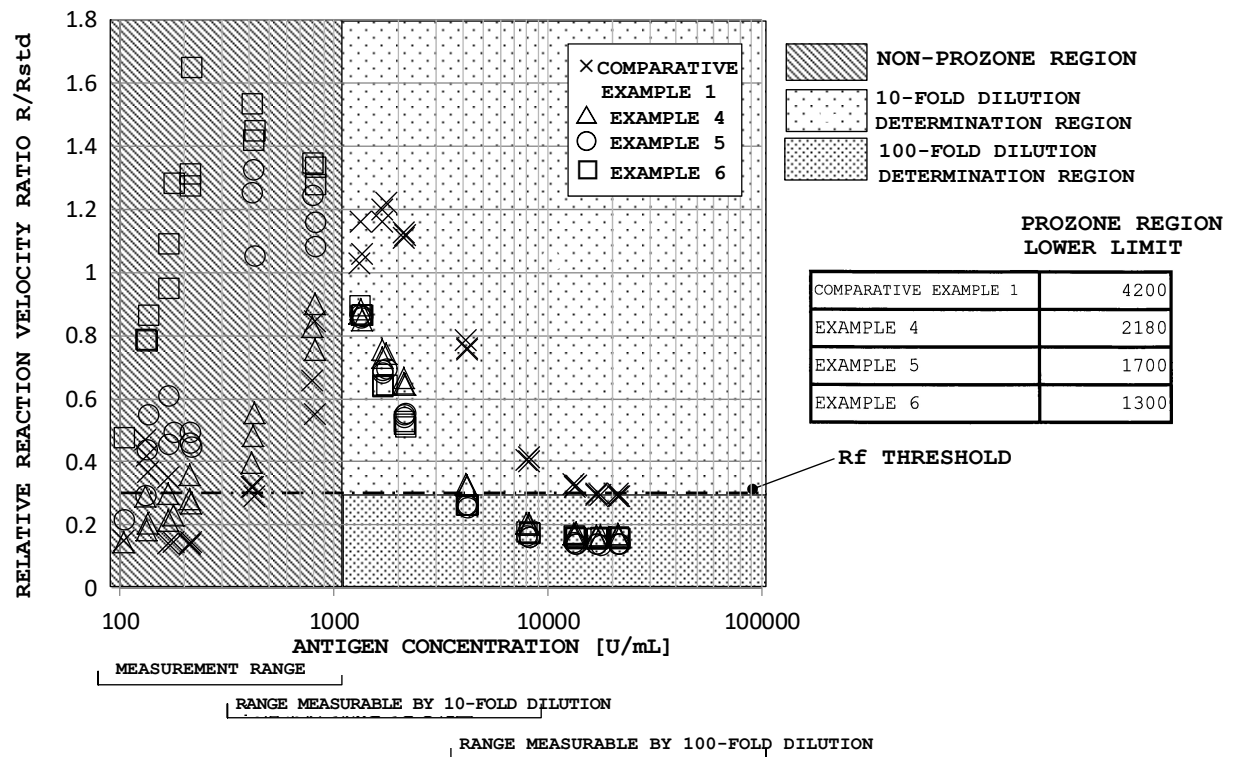


Fig.11

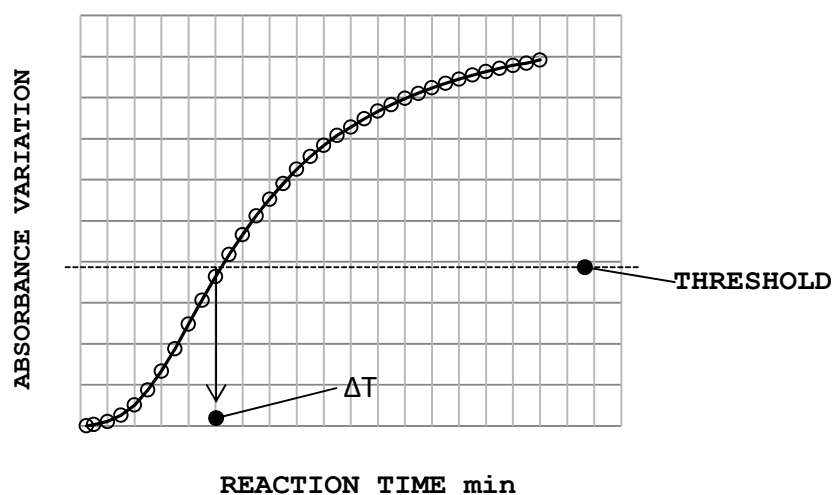


Fig.12

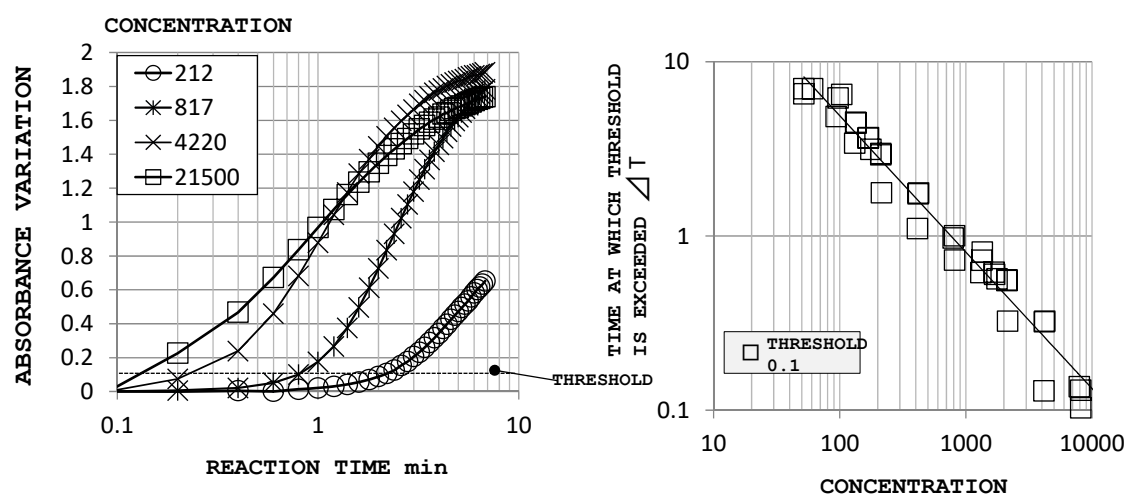


Fig.13

$$Abs_{(t,\alpha,\beta,c,d)} = d - c F_{(t,\alpha,\beta)}$$

$$F_{(t,\alpha,\beta)} = \int_0^t f_{(t,\alpha,\beta)} dt$$

$$f_{(t,\alpha,\beta)} = \frac{1}{\beta^\alpha \Gamma_\alpha} t^{\alpha-1} e^{-\frac{t}{\beta}}$$

CUMULATIVE DISTRIBUTION FUNCTION OF GAMMA DISTRIBUTION

PROBABILITY DENSITY FUNCTION OF GAMMA DISTRIBUTION

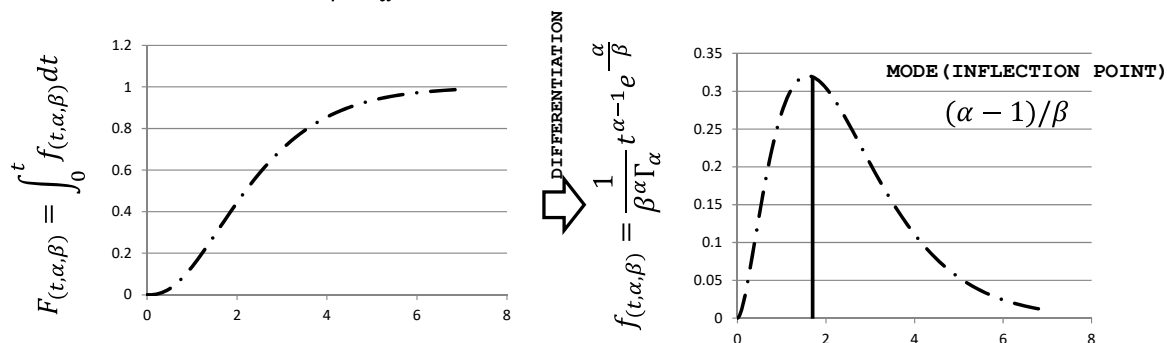
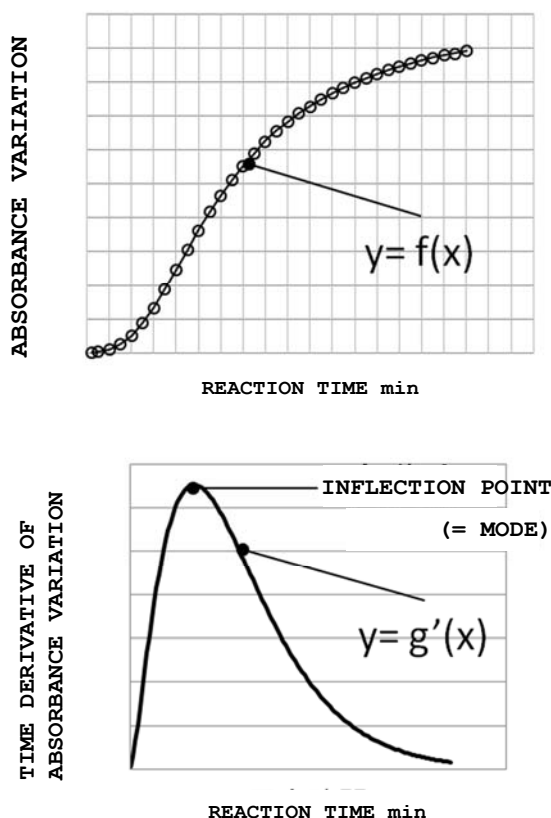


Fig.14



NORMAL DISTRIBUTION

$$g(x, \mu, \sigma) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

GAMMA DISTRIBUTION

$$g(x, k, \theta) = \frac{\gamma(k, x/\theta)}{\Gamma(k)}$$

LOGISTIC DISTRIBUTION

$$g(x, \mu, s) = \frac{1}{1 + e^{-(x-\mu)/s}}$$

FUNCTION GROUP USED FOR FITTING

$$\begin{aligned} y &= f(x) = g(x) \\ y &= f(x) = E \cdot g(x) \\ y &= f(x) = g(x) + F \\ y &= f(x) = E \cdot g(x) + F \end{aligned}$$

Fig.15

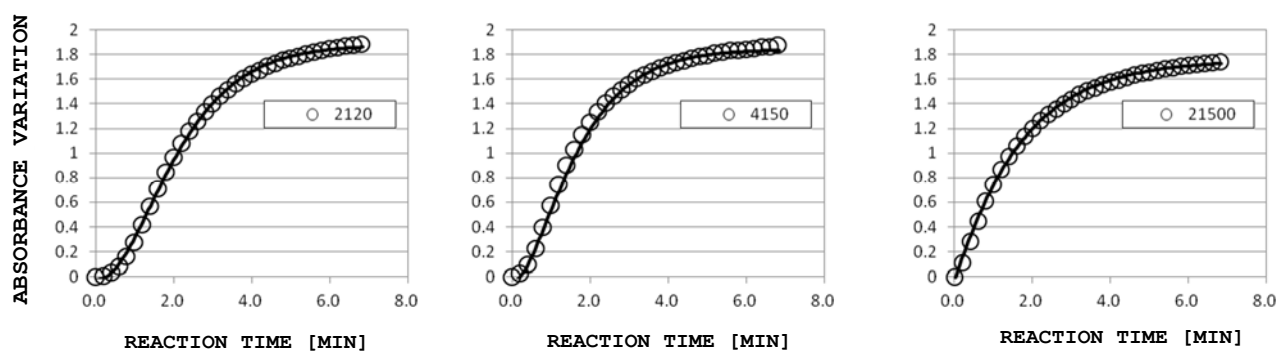


Fig.16

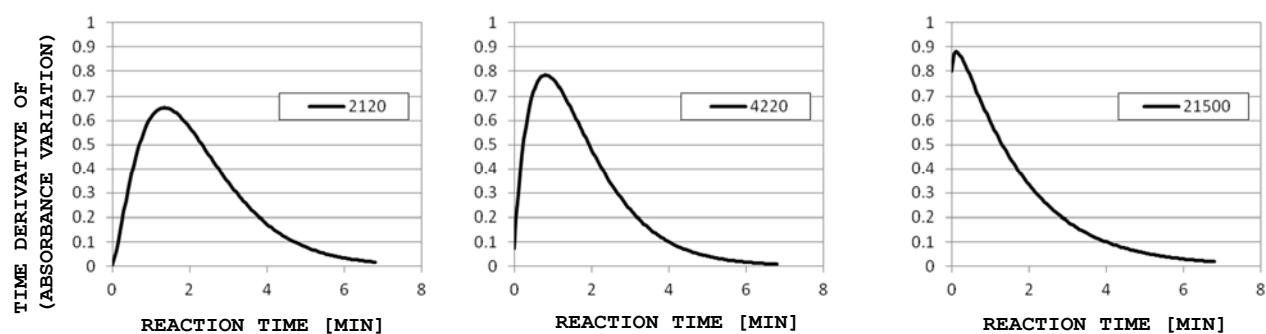


Fig.17

