

---

# Scheme-5 Reactor-1

Part-2, Case-1

$t_a = 900 \text{ sec}$ ,  $t_m = 1200 \text{ sec}$   
 $k_1 = 0.1$ ,  $k_2 = 0.01$

$NB_t/NA_t = 1.66371$

Exponent  $a = 1.5$   
Exponent  $b = 0.5$   
Exponent  $c = 0.5$   
Exponent  $d = 1.5$

$WA = 200$   
 $WB = 83.1856$   
 $NB_t = 4.43657$   
 $V_t = 2.14159$   
 $V_{at} = 1.04159$   
 $Tot.Solv. = 2$   
 $SolA/(SolR+SolA) = 0.5$

$NA_0 = 2.66667$   
 $NB_0 = 0$

Total input = 283.186 kg  
Total output = 283.187 kg

Chemical Balance Error = 0.00188081 kg (% 6.64162e-06)

Solver: Explicit Runge-Kutta (4,5) Variable step (Dormand-Prince Pair)  
Error tolerance: 0.1%

Final Concentrations with Step Size limited to 0.01

$NA \text{ (final)} = 0.0266626$   
 $NB \text{ (final)} = 1.37217e-10$   
 $NR \text{ (final)} = 0.843438$   
 $NS \text{ (final)} = 1.79657$

Final Concentrations with Step Size limited to 0.1

$NA \text{ (final)} = 0.0266635$   
 $NB \text{ (final)} = -1.02464e-08$   
 $NR \text{ (final)} = 0.843454$   
 $NS \text{ (final)} = 1.79655$



