

---

# Scheme-1 Reactor-1

Part-3, Case-2

$t_a = 450 \text{ sec}$ ,  $t_m = 1200 \text{ sec}$   
 $k_1 = 0.1$ ,  $k_2 = 0.002$

$NB_t/NA_t = 1.06019$

Exponent  $a = 1$   
Exponent  $b = 1$   
Exponent  $c = 1$   
Exponent  $d = 1$

$WA = 200$   
 $WB = 53.0093$   
 $NB_t = 2.82716$   
 $V_t = 2.1265$   
 $V_{at} = 1.0265$   
Tot.Solv. = 2  
 $SolA/(SolR+SolA) = 0.5$

$NA_0 = 2.66667$   
 $NB_0 = 0$

Total input = 253.009 kg  
Total output = 253.01 kg

Chemical Balance Error = 0.000292981 kg (% 1.15798e-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

$NA \text{ (final)} = 0.0266321$   
 $NB \text{ (final)} = 0.00152345$   
 $NR \text{ (final)} = 2.45442$   
 $NS \text{ (final)} = 0.185612$

Final Concentrations with Step Size limited to 0.1

$NA \text{ (final)} = 0.026664$   
 $NB \text{ (final)} = 0.00152041$   
 $NR \text{ (final)} = 2.45445$   
 $NS \text{ (final)} = 0.185554$



