Average Reaction Rate Calculations

1- $C_3H_{8(g)}$ + $5\ O_{2(g)}$ → $3\ CO_{2(g)}$ + $4\ H_2O_{(g)}$

3.00   15.0   9.00   12.0
mol/s   mol/s   mol/s   mol/s
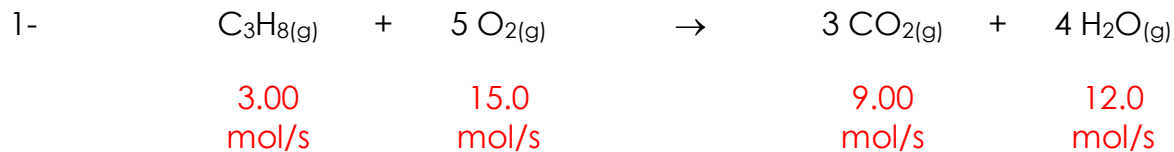
2-   ? mol H_2/min = (245 L/min) (1 mol/24.5 L) = 10.0 mol/min
Al Rate = 6.66 mol/min
HNO_3 Rate = 20.0 mol/min
H_2 Rate = 10.0 mol/min
$Al(NO_3)_3$ Rate = 6.66 mol/min

3-   ? mol NaOH/s = (176 g / 15 s) (1 mol / 40.0 g) = 0.29 mol/s
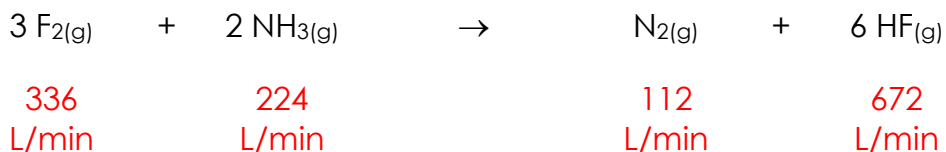NaOH Rate = 12 g/s
H_2SO_4 Rate = 15 g/s
Na_2SO_4 Rate = 21 g/s
H_2O Rate = 5.2 g/s

4-   ? L N_2/min = (22.4 L/mol) (5.00 mol/min) = 112 L N_2/min
Since all gases are at STP, Avogadro's hypothesis applies.

$3\ F_{2(g)}$ + $2\ NH_{3(g)}$ → $N_{2(g)}$ + $6\ HF_{(g)}$

336   224   112   672
L/min   L/min   L/min   L/min

5-   Watch for excess stoichiometry! Use only amounts of chemicals that have reacted!
Fe_2S_3 Rate = 2.50 g/s
HCl Rate = 2.63 g/s
$FeCl_3$ Rate = 3.89 g/s
H_2S Rate = 1.23 g/s