

## Overall Reactions

- So far only considered one reaction relationship
  - e.g.,  $A+B \leftrightarrow C$
- What if we had more than one reaction
  - e.g.,  $A+B \leftrightarrow C$  (r1)
  - $C+D \leftrightarrow E+F$  (r2)
- We could write this as single reaction
  - i.e.,  $A+B+D \leftrightarrow E+F$  (r3)=(r1)+(r2)
- Are  $K_p$ 's for these reactions related?

$$K_{p1} = \frac{P_C}{P_A P_B} \quad K_{p2} = \frac{P_E P_F}{P_C P_D} \quad K_{p3} = \frac{P_E P_F}{P_A P_B P_D} \quad K_{p3} = K_{p1} \cdot K_{p2}$$

*overall  $K_p$  = product of individual step  $K_p$*