18.7: Termolecular Processes

A **termolecular process** is one which involves simultaneous collision of three microscopic particles. In the gas phase, termolecular processes occur much less often than bimolecular processes, because the probability of three molecules all coming together at the same time is less than a thousandth the probability that two molecules will collide.

$$A + B + C \rightarrow D \qquad \text{(single step)}$$

Consequently it is commonly found that if three molecules, A, B, and C, must combine during the course of a reaction, they will do so stepwise. That is, B and C might first combine in a bimolecular process to form BC, which would then combine with A in a second bimolecular process.

$$B + C \rightarrow BC \qquad \text{(step 1)}$$

$$BC + A \rightarrow D \qquad \text{(step 2)}$$

This can usually happen many times over before a successful termolecular collision would occur.