Facilitated transport in a membrane involves a chemical agent as a carrier to increase the rate of transport. A chemical agent can react reversibly with a permeant and yields high selectivity and permeability, which makes facilitated transport a very selective separation technique. The chemical agent carries the substance in the form of a carrier-bound substance; the carrier releases the substance on the other side of the membrane due to chemical conditions (mainly pH and electric charge) and diffuses back. Usually, a carrier with high association and dissociation rate constants, which are similar in magnitude, is desirable. For the transport to be selective, the membrane is permeable to the flow of certain substances and impermeable to the flow of others including the carrier molecule. Therefore, facilitated transport is not described by Fick's law and exhibits saturation at a higher concentration of the permeant.

Facilitated transport is a carrier-mediated process that differs from active transport because the facilitated process cannot transport a substance against its concentration gradient. Therefore, facilitated transport does not require energy input but does require a concentration gradient as the driving force, which is similar to passive diffusion. In facilitated diffusion, substances are transported down the concentration gradient at a much faster rate than would be anticipated based on the molecular size and polarity of the molecule for pure diffusion. The facilitated process, like active transport, is saturable and subject to inhibition by competitive inhibitors. Facilitated diffusion seems to play a very minor role in drug absorption.

In facilitated transport in membranes, a carrier agent can interact specifically with a substrate in the feed mixture, the substance-carrier complex diffuses across the membrane, and the carrier dissociates at the end of the membrane, and finally returns to its original position as shown in Figure 11.4. The exterior substrate concentration has no effect on the rate of transport. The transport rate may reach a saturation point, which is its maximum rate. For example, a red blood cell membrane transports oxygen with the hemoglobin as the carrier. Only the specific substrates are transported, depending on the character of the carrier agent. Only specific inhibitors slow down the facilitated transport. In biological systems, the carrier agents are mainly proteins and are called permeases. For example, myoglobin has a single oxygen-binding site and is present in the muscle cytosol, and it binds to oxygen in a reversible reaction: