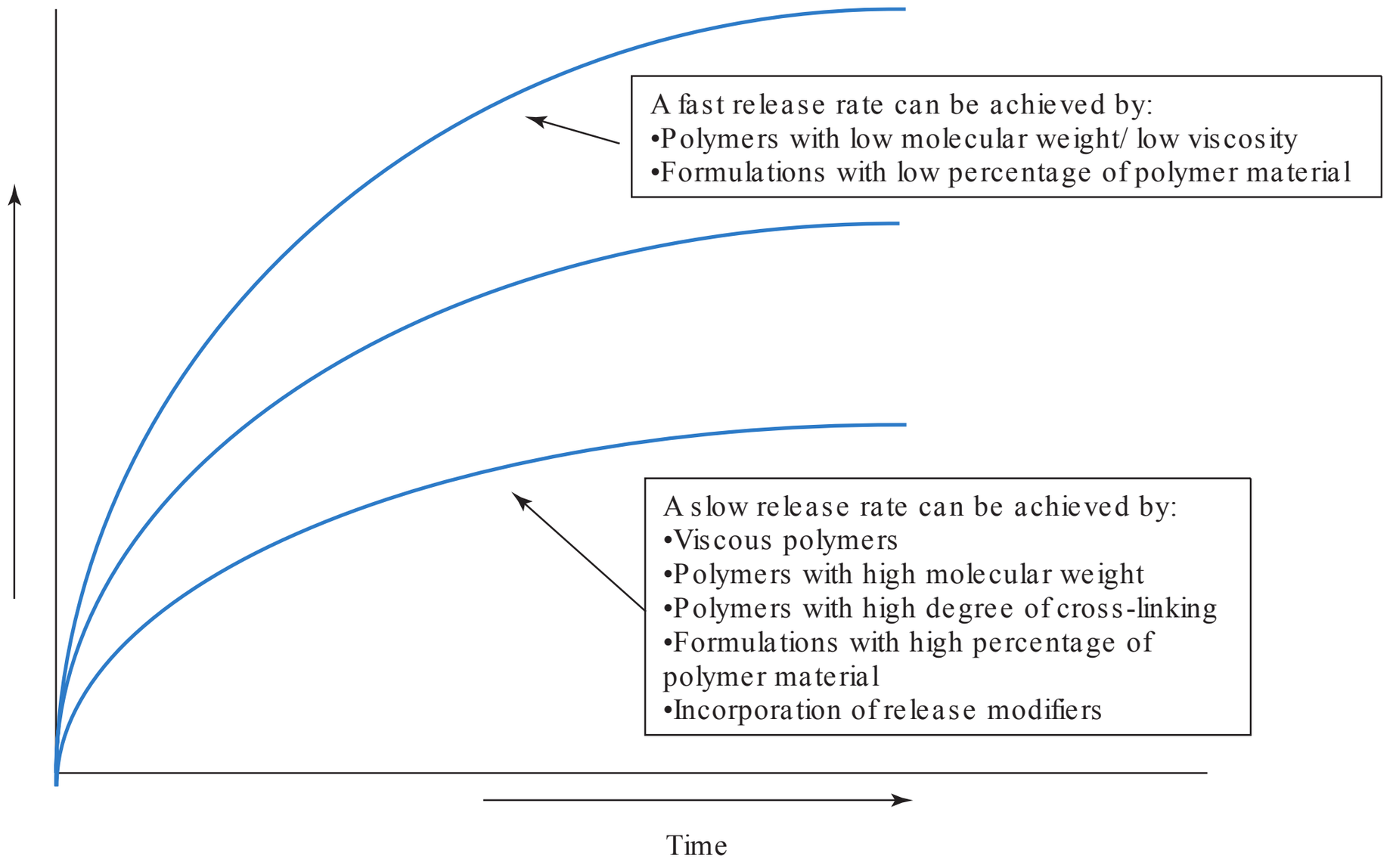

Fig. 31.8 • Theoretical release profles for hydrophilic matrix tablets for extended release (fast, medium and slow profles).

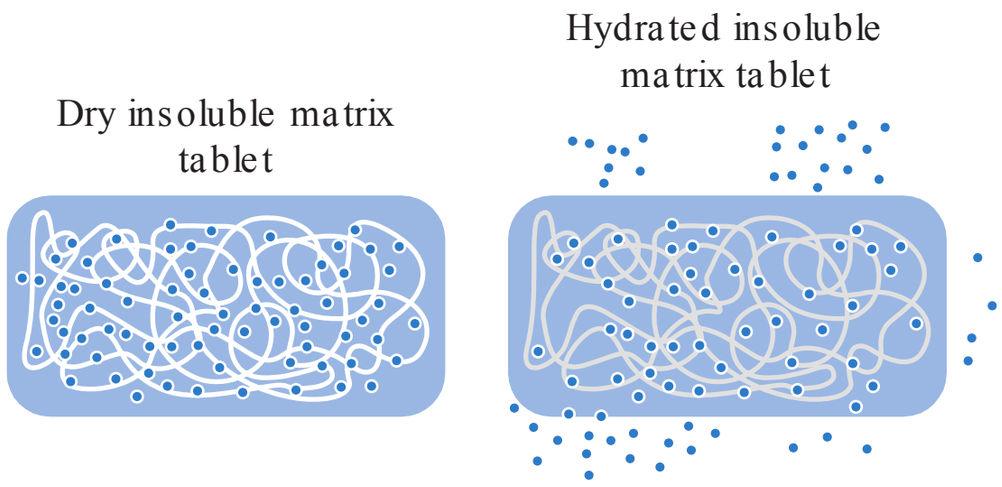

Fig. 31.9 • Dry insoluble matrix tablet has channels (white) interspersed within the polymer. These channels hydrate and drug can diffuse out.

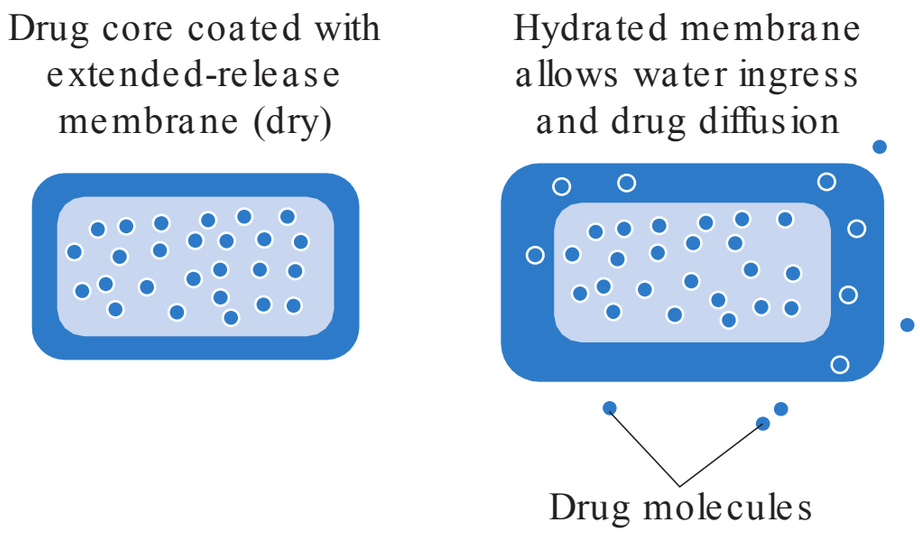

Fig. 31.10 • Drug release mechanism from a dosage form coated with a modifed-release membrane.

Membrane-controlled systems

Membrane–controlled delivery systems differ from the matrix formulations in that the rate-controlling part of the system is a membrane through which the drug must diffuse, rather than diffusing through the whole matrix. Generally, drug is concentrated in the core, and must traverse a polymeric membrane or film which slows down the release rate. Important criteria for such a dosage form are that the drug should not diffuse in the solid state. Upon exposure to an aqueous environment, water should be able to diffuse into the system and form a continuous phase through which drug diffusion and release can occur (Fig. 31.10). Drug release through a membrane is controlled by the thickness and the porosity of the membrane, as well as the solubility of the drug in the gastrointestinal fluids.

The biopharmaceutical considerations of transit and fluid are much the same as for monolithic matrix tablets. However, membrane-controlled drug delivery systems may be more likely to be in the form of pellets than in monolithic systems. Pellets and tablets have different biopharmaceutical considerations. For example, tablets are more likely to become trapped in the stomach if administered with food