

- (1) Random copolymer
 AABAAABBABAAABBA
- (2) Alternative copolymer
 ABABABABABABABAB
- (3) Graft copolymer
 AAAAAAAAAAAAAAAAAAAAA
 B B B B
 B B B B
 B B B B
 B B B
 B B
 B
- (4) Star copolymers
 B
 B
 B
 B
 B
 B
 AAAAAAAAAAAAAAAAAAAAA
 B
 B
 B
 B
- (5) Block copolymers
 Diblock copolymer (AB-type)
 AAAAAAAAAABBBBBBBBBB
- Triblock copolymer (ABA-type)
 AAAAAAAAAABBBBBBBBBBAAAAAAAAA
- Triblock copolymer (BAB-type)
 BBBBBBBBBBAAAAAAAAABBBBBBBBBB
- (AB)_n block copolymers ((AB)_n multi-segment type)
 {AAAAAAAAABBBBBBBBBB}_n

FIGURE 13.1 Classification of copolymers.

Pharmaceutical research on polymeric micelles has mainly focused on two kinds of block copolymers, namely, AB block copolymers or diblock copolymers and ABA or BAB block copolymers known as triblock copolymers (Bader et al., 1984; Yokoyama et al., 1990, 1991; Kwon and Okano, 1996, 1999; Alakahov and Kabanov, 1998; Kwon, 1998, 2003). The most common hydrophilic block (A) of the block copolymers is polyethylene oxide (PEO). This polymer is highly hydrated through hydrogen bonding and sterically stabilizes surfaces of the polymeric micelles in aqueous systems.

Of the triblock copolymers, the Pluronic series are the most popular. According to the product information by BASF, the nomenclature of Pluronic surfactants can be described based on the molecular weight ranges of the hydrophobe propylene oxide (PO) against the weight-percent of the hydrophile ethylene oxide (EO) present in each molecule. The letter-number combinations can be used to identify the various products of the Pluronic series. The alphabetical designation explains