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## 二元Pluronic嵌段共聚物的胶凝化行为及机制探讨

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**中文摘要:**以二元Pluronic嵌段共聚物(F127/F68)混合体系为研究对象,通过流变性质的测定考察其胶凝化行为,在共聚物总质量百分比为20%时,随着F127与F68质量比由10:0变为8:2,可使胶凝温度从20.8℃升至38.5℃,但弹性模量降低了83.5%,所形成的凝胶具剪切变稀特性。差示扫描量热分析结果表明临界胶束温度不随F127/F68质量比发生明显改变,胶凝化过程为热力学可逆过程且在胶凝温度处未检测到相应的吸热峰。黏度法研究胶束亲水外壳,F68所占的比例越大,胶束表面的水化程度越小。粒度分析显示胶束的平均粒径随F68比例的增加略有减小。图示了不同质量比的F127/F68溶液从胶束到凝胶的转变过程,表明提高F127的比例可使胶束数量增多,升高温度可使胶束间的斥力增强,两者均有助于增加胶束所占的体积分数,而利于形成凝胶。

**中文关键词:**[Pluronic嵌段共聚物](#) [胶凝机制](#) [二元体系](#) [流变性质](#)

## Gelation behavior and mechanism of binary Pluronic block copolymers

**Abstract:** Gelation behavior of binary Pluronic block copolymers of F127/F68 was evaluated by rheological measurements. The results showed that when the total copolymer mass fraction was fixed at 20%, the gel transition temperature increased from 20.8 °C to 38.5 °C and the elasticity modulus decreased 83.5% with the weight ratio of F127/F68 from 10:0 to 8:2. The formed gel was typical of shear thinning property. Nevertheless, according to DSC analysis, the critical micelle temperature hardly changed with the composition of the mixture, and the gelation process was thermo-reversible and no endothermic peak was detected at the gel transition temperature. The hydrophilic "corona" of the micelle was studied using viscometry. The results showed that the shell hydration of the micelle decreased while increasing the ratio of F68. Particle size analysis found that the micelle was slightly smaller as the proportion of F68 in the mixture was increased. The diagram exhibited the transition process of the binary system from micelle to gel. Increased the ratio of F127, more micelles would be involved in the formation of gel. And raised the temperature, the repulsive interactions among close-packed spherical micelles became stronger. Both of them could help to increase the micellar volume fraction, which could benefit to the gel formation.

**keywords:** [Pluronic block copolymers](#) [gelation mechanism](#) [binary system](#) [rheological properties](#)[查看全文](#) [查看/发表评论](#) [下载PDF阅读器](#)

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