

Fabrication and characterizations of interpenetrating polymer network membranes containing hydrogel capsules

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Hydrogels are soft solids or quasi-solid materials containing a large amount of water in a three-dimensional network formed by covalent bonds, non-covalent or topological interactions. Recently, hydrogels have been applied in a wide range of applications. Especially, these materials are widely utilized in various bio-medical fields. As a new application, here we suggest the use of hydrogel as a mediator for releasing water-oil emulsion at a constant rate. In this work, we have prepared highly tough interpenetrating polymer network (IPN) membranes containing hydrogel capsules. The prepared membranes are very stretchable and tough because they possess well-developed IPN structure with many chemical and ionic crosslinking points. In addition, the embedded hydrogel capsules include a large amount of water-oil emulsion. The releasing rate of water-oil emulsion could be effectively controlled by two-step through the hydrogel capsules and IPN hydrogel membrane. Especially, we have controlled and optimized the size and compositions of hydrogel capsules for practical uses. (Acknowledgements- No. C0532418 & No. 10047796)