



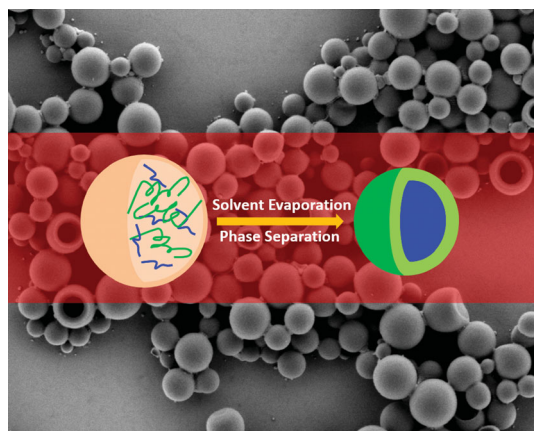
Macromolecular Chemistry and Physics

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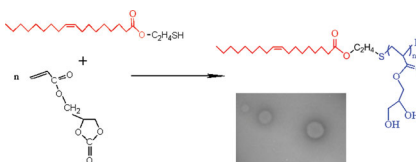
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Front Cover: A simple and mild approach for encapsulation of reactive azide-terminated polyisobutylene in nanocontainers of poly(vinyl formal) is reported. The core-shell nanoparticles can be visualized directly in fluorescence microscopy by labelling the two polymers with different dyes or extracting the core polymer with a selective solvent. Further details can be found in the article by Y. Zhao, D. Döhler, L.-P. Lv, W. H. Binder, K. Landfester, and D. Crespy* on page 198.



Full Papers

Various biobased compounds are polymerized to give amphiphilic polymers according to a simple procedure. Telomerization of glycerin-derived acrylate with mercaptan-modified fatty acids as telogen agents is studied, leading to telomers capable of self-assembling into nanosized spherical particles in aqueous solution.

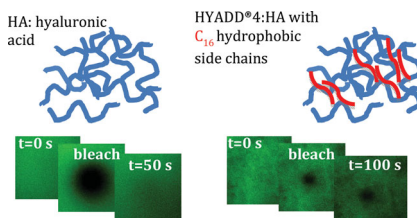


Synthesis of Amphiphilic Polymers Based on Fatty Acids and Glycerol-Derived Monomers – A Study of Their Self-Assembly in Water

J. Rotta, P. D. Pham, V. Lapinte, R. Borsali, E. Minatti, J.-J. Robin*

Macromol. Chem. Phys. 2014, 215, 131–139

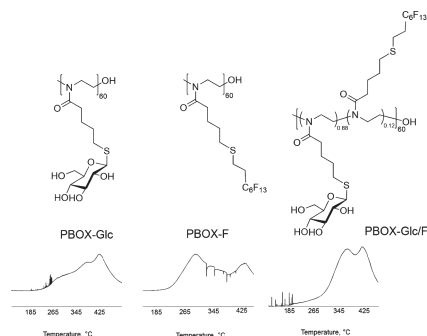
Fluorescence recovery after photobleaching shows dramatic differences in the diffusional behavior of hyaluronic acid (HA) and partially hydrophobized hyaluronic acid (HYADD4): in HA, the fluorescence is recovered after about 50 s, whereas in HYADD4 the bleach remains after several minutes. The polymer concentration, $C_p = 0.8\%$ (w/v), is the same in both experiments.



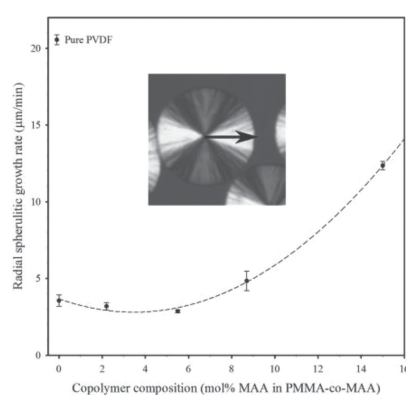
Collective Dynamics and Transient Behavior of Partially Hydrophobic Hyaluronic Acid Chains

I. Finelli, E. Chiessi, L. Oddo, D. Galesso, D. Renier, G. Paradossi*

Macromol. Chem. Phys. 2014, 215, 140–147

Direct Pyrolysis - Mass Spectrometry Analysis of Thermal Degradation of Thio-Click-Modified Poly(2-oxazoline)N. Atilkan, H. Schlaad, Y. Nur,*
J. Hacıoglu**Macromol. Chem. Phys.* **2014**, 215, 148–152

Comprehensive DP-MS analysis of the thermal degradation characteristics of thio-click-modified poly[2-(3-butenyl)-2-oxazoline] (PBOX), carrying glucose and/or perfluoroalkyl groups is carried out. Significant changes in the thermal stability and thermal degradation products are observed depending on the structure of the side chain.

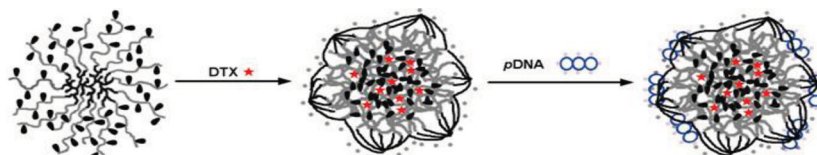
Crystallization of Poly(vinylidene fluoride) in Blends with Poly(methyl methacrylate-co-methacrylic acid) CopolymersF. A. Landis,* S. R. March Jr.,
D. Deivasagayam, R. T. Mathers*Macromol. Chem. Phys.* **2014**, 215, 153–162

Poly(methyl methacrylate-co-methacrylic acid) (PMMA-co-MAA) copolymers are synthesized and blended with poly(vinylidene fluoride) (PVDF). It is observed that the crystallization rate of PVDF is reduced when the MAA content is <5.5 mol% in the copolymer due to enhanced intermolecular interactions. At higher MAA contents, the growth of the PVDF crystallites in the blend approaches that of pure PVDF.

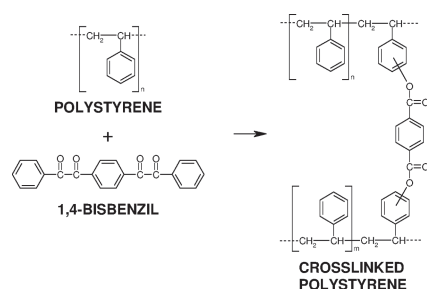
Dual-Functional PEI-Poly(γ-Cholesterol- ι -Glutamate) Copolymer for Drug/Gene Co-deliveryJ. Zhang, D. Fang, Q. Ma, Z. He, K. Ren,
R. Zhou, S. Zeng, B. Li, L. He, G. He,*
X. Song**Macromol. Chem. Phys.* **2014**, 215, 163–170

A series of novel amphiphilic PEI-poly(γ-cholesterol- ι -glutamate) (PEI-PCHLG) copolymers are synthesized and characterized. One of PEI-PCHLG copolymers can self-assemble into micelles. The PCHLG block assembles into micelles with high

drug entrapment, and the grafted PEI block can act as a hydrophilic section exposed outside the micelles, which are capable of carrying genes. Thus PEI-PCHLG copolymers are potential carriers for drug/gene co-delivery.

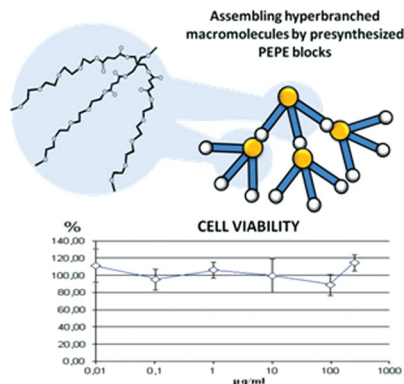
**1,4-Bisbenzil: Visible-Light- and Heat-Assisted Crosslinking of Polystyrene Films**

I. Lukáč,* C. Kósa, B. Husár

Macromol. Chem. Phys. **2014**, 215, 171–176

A novel method of crosslinking of polystyrene films by 1,4-bisbenzil is presented. The crosslinking occurs in two steps: in the first step, polystyrene film doped with 1,4-bisbenzil is irradiated with visible light ($\lambda > 400$ nm) in the presence of oxygen. In the second step, photoperoxidized polystyrene is subsequently thermally treated to cause crosslinking.

Synthesis of a novel multifunctional polyester-co-polyether (PEPE) block based on asymmetrically substituted pentaerythritol, succinic acid, and tetraethylene glycol is reported. The proposed reaction conditions allow selective preparation of the product in high overall yield. The block is used in the assembly of PEPE dendrons of second generation by classical step-by-step and alternative “block by block” strategies.



Convenient Synthesis of a Polyester-co-Polyether Block for Assembling Biocompatible Hyperbranched Macromolecules

I. Elkin, P. Hildgen*

Macromol. Chem. Phys. **2014**, 215, 177–181

Networks of butyl acrylate are photo-polymerized both in the presence and absence of a RAFT agent. The Young's moduli of the RAFT networks are lower than those of conventionally obtained networks. With an increasing amount of RAFT agent, the Young's modulus

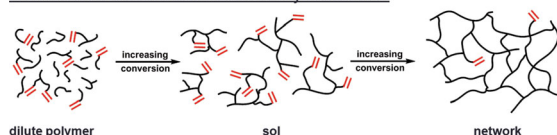
decreases and the strain at break values increase, respectively. The network density, the apparent molar mass of the network chains, and the swelling show significant differences between RAFT networks and conventionally obtained networks.

The Influence of RAFT on the Microstructure and the Mechanical Properties of Photopolymerized Poly(butyl acrylate) Networks

R. Henkel, P. Vana*

Macromol. Chem. Phys. **2014**, 215, 182–189

Reversible-Deactivation Radical Polymerization:



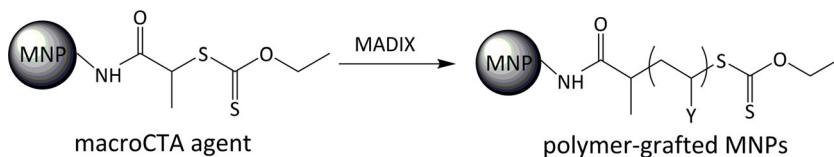
Magnetite-polymer core-shell structures are materials that hold significant promise for the development of many branches of science and industry. The reversible addition-fragmentation chain transfer/macromolecular design via interchange of

xanthates (RAFT/MADIX) polymerization is an easy way to obtain stable polymer-coated magnetic nanoparticles (MNPs) with controlled architecture and composition of the organic shell, and therefore with controlled properties of the target nanostructures.

Surface-Initiated RAFT/MADIX Polymerization on Xanthate-Coated Iron Oxide Nanoparticles

A. Z. Wilczewska,* K. H. Markiewicz

Macromol. Chem. Phys. **2014**, 215, 190–197



Reactive polymers for self-healing materials are encapsulated with a high efficiency in polymer nanocontainers. The concentration of surfactant plays a major role in the encapsulation efficiency.



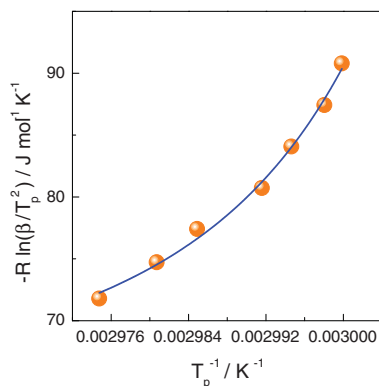
Facile Phase-Separation Approach to Encapsulate Functionalized Polymers in Core-Shell Nanoparticles

Y. Zhao, D. Döhler, L.-P. Lv, W. H. Binder, K. Landfester, D. Crespy*

Macromol. Chem. Phys. **2014**, 215, 198–204

Polymer Melting Kinetics Appears to be Driven by Heterogeneous Nucleation

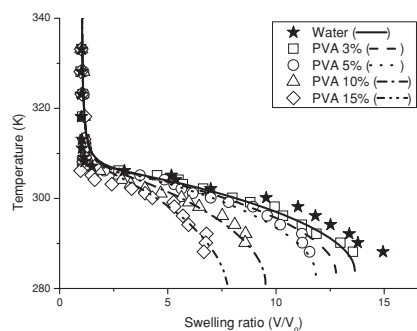
S. Vyazovkin,* B. Yancey, K. Walker

Macromol. Chem. Phys. **2014**, 215, 205–209

By using the well-known Kissinger plot, $\ln(\beta/T_p^2)$ vs. T_p^{-1} , a temperature dependence of the effective activation energy for polymer melting can be evaluated. A simple theoretical treatment of this dependence in the framework of a nucleation model allows nucleation parameters to be obtained that consistently indicate that polymer melting is driven by heterogeneous nucleation.

Swelling Behaviors of Poly(*N*-isopropylacrylamide) Nanosized Hydrogel Particles/Poly(vinyl alcohol)/Water Systems: Effect of the Degree of Hydrolysis of PVA

S. M. Kim, J. S. Choi, Y. C. Bae*

Macromol. Chem. Phys. **2014**, 215, 210–216

The swelling behaviors of poly(*N*-isopropylacrylamide) (PNIPA) gel particles are measured in aqueous poly(vinyl alcohol) (PVA) solutions. The absorption of PVA is influenced by the degree of hydrolysis of the PVA. Model parameters are obtained from corresponding liquid–liquid equilibria (LLE) data or experimental conditions to give physical meaning. In addition, various equilibrium properties are presented using the same parameters.

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