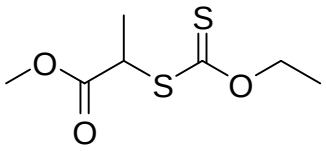
AQUEOUS RAFT/MADIX POLYMERIZATION: SAME MONOMERS, NEW POLYMERS

M. Destarac

Laboratoire HFA, CNRS UMR 5069, University of Toulouse, 118 route de Narbonne, 31062 Toulouse, France.
Tel: (+33) (0)5 6155 6354, Fax: (+33) (0)5 6155 8204, E-mail: destarac@chimie.ups-tlse.fr

ABSTRACT

Rhodixan® A1 (scheme 1) is a registered RAFT/MADIX agent of choice for the large scale production of copolymers with controlled architectures. One of main strengths of MADIX lies in the fact that Rhodixan® A1-mediated polymerizations obey the classical kinetic rules of radical polymerization with little effect of the initial xanthate concentration on the rate of polymerization. In addition, it can be easily implemented in water, hydroalcoholic solutions and in aqueous emulsion polymerization which makes it particularly attractive for the development of "greener" CRP processes.[1]



Scheme 1. Rhodixan® A1 (MADIX) agent

MADIX allows the controlled polymerization of a wide range of functional monomers. It is suited for acrylates and acrylamido monomers, and more specifically for vinyl monomers like vinyl lactams, vinyl esters and vinyl phosphonates.[1] Different chemical methods can be easily implemented to remove xanthate end groups after polymerization.
The most recent studies of our group were aimed at generating kinetic data and bringing new solutions for a faster industrial development of the MADIX technology. The following topics will be covered (i) the kinetics of transfer reactions involving Rhodixan® A1, (ii) aqueous MADIX polymerizations at ambient temperature, (iii) synthesis of novel block copolymers from"old" monomers.

References:

[1] D. Taton, M. Destarac, S.Z. Zard, "Macromolecular Design by Interchange of Xanthates: background, design, scope and applications", in *Handbook of RAFT Polymerization*, Barner-Kowollik C, Ed.; Wiley-VCH: Weinheim **2008**, chap. 10, p. 373.