

# FORMULATION OF BIOBASED COPOLYMERS AS EMULSIFIERS

Sara Barriga<sup>\*a</sup>, Elian Chekaf<sup>a</sup>, Théodore Vanbesien<sup>b</sup>, Kedafi Belkhir<sup>a</sup>, Jonathan Potier<sup>a</sup>

<sup>a</sup> Univ. Lille, CNRS, INRAE, Centrale Lille, UMR 8207 - UMET - Unité Matériaux et Transformations, F-59000 Lille, France

<sup>b</sup> Advanced Solution Department, Roquette Frères, 62136 Lestrem, France

\* sara.barrigavaldez@univ-lille.fr

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## Résumé :

The global production of petro-based polymers currently exceeds 400 million tons per year, raising increasing concerns about their environmental impact and driving interest in sustainable alternatives. In response, bio-based materials derived from renewable resources have emerged as promising candidates [1]. Within this framework, Roquette aims to replace conventional petro-sourced emulsifiers with starch-derived compounds. Among them, isosorbide, a bio-based platform molecule obtained by the double dehydration of sorbitol, stands out due to its versatility in substituting petroleum-derived materials. We have demonstrated that poly(isosorbide monomethacrylate)s (PIMMAs) are hydrophobic bio-based polymers with a limited solubility in water of around 5 g·L<sup>-1</sup> [2-3]. In contrast, poly(ethylene glycol) (PEG) is a well-known hydrophilic, non-ionic polymer that exhibits stealth behavior [4]. To design a polymeric emulsifier, a PEG macro chain transfer agent (CTA) was synthesized, and further used to join PIMMA and PEG into di-block copolymers by Radical Addition Fragmentation chain Transfer (RAFT) polymerization.

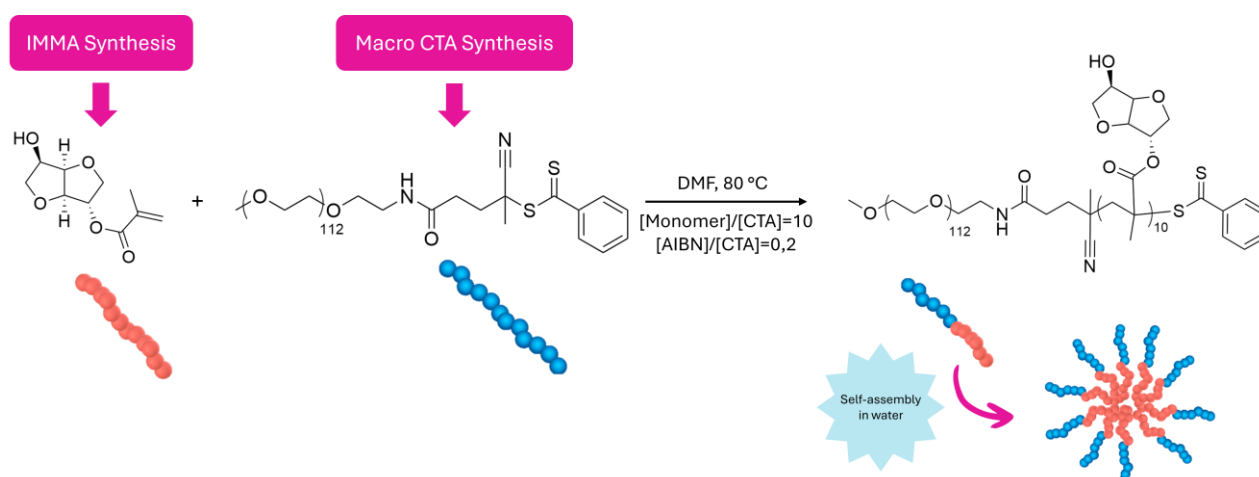


Figure 1. Graphical abstract.

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