AMIDE-IMIDE TERPOLYMER DYNAMIC NETWORK

G. Scurani[a], F. Parenti[a*]

[a]Department of Chemical and Geological Sciences, University of Modena and Reggio Emilia, via G. Campi 103, 41123 Modena, Italy (giulia.scurani@unimore.it)

Since the 1950s, 6300 million tons of plastics have been produced of which only 9% have been recycled once. Thermosets account for 22% of the total plastic production. Since they cannot be recycled, or reprocessed, they are incinerated or are accumulated in landfills[1]. Thermosets possess enhanced thermo-mechanical stability and better chemical, wear, and creep resistance properties than thermoplastics. Therefore, these network materials are employed in many advanced lightweight applications, such as aerospace, automotive, wind turbine, and thermal insulation[2].

Dynamic covalent networks can combine the peculiar properties of thermosets and the re-processability of thermoplastics due to the presence of exchangeable chemical bonds activated by simple external stimuli, such as light or heat[2-4].

The ever-increasing number of dynamic exchange mechanisms, coupled with the wide variety of monomers exploited to obtain polymer chains, enables the tailored synthesis of advanced materials with desired mechanical properties for specific applications.

In this study, we present a new dynamic network formed through the dissociative amide-imide exchange mechanism on a terpolymer containing also a biobased co-monomer.

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