## «Reversible cross linked epoxy-based polymers for Composite Materials»

## **Konstantinos Xydias**

## ABSTRACT

Composites are widely used in industry and find numerous applications in various fields such as aeronautics, architecture, transport, energy production and storage, etc. The range of categories of composites is wide, with each of them possessing the properties conferred by its individual components and commensurate with the intended use. Of particular importance for the production of high performance composites are polymers, which, due to their unique combination of low weight and good mechanical properties, are used as matrix material for composites that are used in demanding applications such as in aeronautics. Epoxy resins are the most frequently used thermoset polymers due to their excellent mechanical properties. A major drawback of such materials is the inability to reprocess and recycle, which gives rise to the need to develop new materials that overcome these limitations while having high performance. Recently, vitrimers a new class of polymers has attracted research interest as it combines the properties of traditional thermosets with end-of-life recycling. This advantage is due to their chemical structure which includes dynamic covalent cross-linking that allows reprocessing. This review follows the path towards the creation of the first vitrimers and the innovations that have contributed to the progress made in recent years in this direction. Herein the most prominent methods of developing vitrimers are discussed and the most important research approaches to date are reviewed.

## Keywords:

[Polymers, Composites, CANs, Crosslinks, Vitrimers]