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References

[1] M. Parchami, S. Agnihotri, M. J. Taherzadeh, *Bioresource Technology* **2022**, *362*, 127764.
[2] C. Sriwong, S. Boonrungsiman, P. Sukyai, *Industrial Crops and Products*, **2023**, *192*, 115979.
[2] S. Torgbo, V.M. Quan, P. Sukyai, *Cellulose* **2021**, *28*, 5219-5240.
[3] S. Rivas, L. López, C. Vila, J.C. Parajó. *Bioresource Technology* **2021**, *342*, 125967.

Sustainable aliphatic/aromatic furan-based films for food packaging applications

Valentina Siracusa[1], Agata Zubkiewicz[2], Anna Szymczyk[2], Rafaël J. Sablong[3], Michelina Soccio[4], Giulia Guidotti[4], Nadia Lotti[4]

[1] Department of Chemical Science, University of Catania, Viale A. Doria 6, 95125 Catania, Italy

[2] Department of Mechanical Engineering and Mechatronics, West Pomeranian University of Technology, Al. Piastów 19, PL 70-310 Szczecin, Poland

[3] Polymer Technology Group/Eindhoven (PTG/e) B.V., De Lismortel 31, 5612 AR Eindhoven, The Netherlands

[4]Department of Civil, Chemical Environmental and Materials Engineering, University of Bologna, Via Terracini 28, Bologna, Italy

Email: *vsiracus@dmfci.unict.it*

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To address the requirements of the so called “circular economy”, reuse of natural sources and recycling should be maximized, and a drastic reduction of wastes should be achieved. This is particularly true for plastic products, whose production was of about 390.7 million tonnes in 2021 [1]. Interestingly, about 44% of the total plastic produced is used for packaging applications [1]. For this reason, from the packaging point of view, the main objective is to find solutions effective in preserving or even prolonging the shelf-life of the packaged products. This could also avoid the massive waste of food products, which is one of the main plague of our century. Moreover, if the volumes of plastics are considered, flexible packaging should be preferred to rigid one, in order to minimize the consumption of both sources and energy during production and transport [2]. Another challenge is related to the use of renewable sources to produce bio-based building blocks, which can be used, in turn, for the eco-design of sustainable polymers, characterized by the same properties as their fossil-based counterparts. In recent years, 2,5-furandicarboxylic acid (FDCA) is being attracting considerable attention among bio-based building blocks, being one of 12 high value-added chemicals obtained from sugars according to the US Department of Energy. Moreover, it can be derived from second and third generation cellulosic feedstocks, such as non-food crops and wastes, thus avoiding the exploitation of both food and lands cultivated for food production. According to this, furan-based polyesters started being investigated as sustainable alternatives to conventional fossil-based ones, such as poly(ethylene terephthalate) (PET) and poly(trimethylene terephthalate) (PTT).
In the present contribution, we realized aromatic/aliphatic random copolymers poly(trimethylene 2,5-furandicarboxylate-co-trimethylene sebacate) (PTFcoPTSeb) for