

Editorial corner – a personal view

Expressing polymers for a sustainable development

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The dominant model of the last two centuries in terms of materials managements was based on the sequence *take – make – use – dispose* with focus on the economic growth regardless the way materials were used or what happened to them at the end of product life. Today, with a global population exceeding seven billion and continuing to rise, this model is no longer sustainable. In fact, the eco-system has limited capacities to cope with the pressure placed on it and, concurrently, the increasing complexity of the products has generated a dependence on ‘critical raw materials’ whose availability and accessibility is rapidly decreasing. At an academic level, the awareness of the importance of a sustainable development is reflected by the increasing number of courses introduced by Universities incorporating concepts of sustainability into engineering, materials and design programs (ISBN: 978-0-08-100176-9).

The development of more sustainable engineering materials largely depends on the efforts of researchers acting in both academy and industry. Research in polymer science and technology certainly might have a relevant role in this path. New ideas are needed for a larger use of materials produced from renewable resources and/or with a lower environmental impact. For example, as reported in a recent editorial corner in this Journal (<https://doi.org/10.3144/expresspolymlett.2017.57>), the high interested for the potential use of ‘green’ composites in automotive applications is pushing the development of more environmentally friendly and recyclable natural/bio-fiber composites. New opportunities can also come from a clever usage of wood or wood derivatives products. Micro- and

nano-cellulose can be used to efficiently reinforce various polymeric matrices, including biodegradable ones (<https://doi.org/10.3144/expresspolymlett.2017.26>), or to improve the properties of structural composites (<https://doi.org/10.3144/expresspolymlett.2017.6>). With the existing technology, ultrathin (less than 200 microns) wood laminae can be obtained in a relatively inexpensive way and used to obtain fully biodegradable and thermo-formable laminates by coupling them with suitable thermoplastic matrices in an approach similar to the hand lay-up technique. The feasibility of this approach has been recently proven with a biodegradable matrix such as polyvinyl alcohol (<https://doi.org/10.1002/pc.24040>).

A ‘sustainability-oriented’ polymer research can also contribute to a more efficient energy management, as it can be easily understood from a couple of examples recently published in this Journal: electrical energy can be harvested and stored by a proper integration of engineered polymer blends or nanocomposites embedded in wearable connected devices (<https://doi.org/10.3144/expresspolymlett.2017.65>), while thermal energy can be stored and released in highly flexible polymer blends containing nanofilled phase changing materials (<https://doi.org/10.3144/expresspolymlett.2017.71>).



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