Editorial corner – a personal view

Pharmaceuticals prepared by continuous polymer technologies

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Accelerating convergence between the polymer and pharmaceutical technologies is one of the most exciting examples of the cross-fertilization tendencies within the materials science in the 21st century. The extended use of polymers and the composite structure in solid pharmaceuticals should have been induced it earlier but the conservative approach (based on safety arguments) of pharmacists hindered the spread of continuous processes in this field. The next decades will, however, bring about the technology of pharmaceutical plants getting closer to that of the plastic factories. The roots of this change, i.e. pharmaceuticals produced by extrusion and electrospinning, appeared already in the scientific literature and patents. The innovation in the pharmaceutical industry can be accelerated this way rather than by the expensive development of new drugs. The current task is to clarify the advantages of such interdisciplinary cooperation. The last step of the synthesis (crystallization) is expected, for example, to be integrated with continuous formulation processes in the pharmaceutical plant of the future. Positive feedbacks of this radical change to the plastic industry can be noticed already nowadays. Special types of polylactic acid, polyhydroxybutyrate and other biodegradable polymers, the larger scale application of which was hindered by economic reasons, have found substantial market share in the pharmaceutical industry. After recovery of the investment costs these polymers can spread out in the plastic industry in optimized and well-controlled way. The remaining task is the

development of specific functional properties, such as the fire retardancy. Investment in the supercritical extrusion is also expected for pharmaceuticals, the heat sensitivity of which needs this gentle technology badly. These developments, coupled with in-line process control (required by real time release) will provide very positive influence to the traditional plastic industry as well. In-line process control accompanied by total management and continuous development of the technology, called ‘Process Analytical Technology (PAT)’, need the application of recently developed advanced mathematical (chemometric) algorithms, which, on the other hand, have been proven to be very useful tools for spectroscopic identification and classification of components of mixed polymer wastes.

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